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ANNALS

OF THE

SOUTH AFRICAN MUSEUM.

VOLUME II.

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ANNALS

OF THE

SOUTH AFRICAN MUSEUM.

VOLUME II

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ANNALS

OF THE

SOUTH AFRICAN MUSEUM.

I.—*On a Collection of Slugs from South Africa, with Descriptions of some New Species.*

—By Walter E. Collinge, F.Z.S., *Assistant Lecturer in Zoology and Comparative Anatomy, Mason University College, Birmingham.*

(Plates I. and II.)

Through the kindness of Mr. J. H. Ponsonby, I have recently had the opportunity of examining a small collection of slugs, the property of the Trustees of the South African Museum, and I here wish to express my best thanks to him for placing the same in my hands.

The collection is an exceedingly interesting one, for in addition to adding two well-known species to the South African fauna, there are four new species, viz., 1 *Amalia*, 1 *Apera*, and 2 *Oopelta*.

I hope at no distant date to be able to examine the whole of the slug collection in the South African Museum, which Mr. R. M. Lightfoot has very kindly promised to forward to me for investigation.

An examination of the published records of the molluscan fauna of this region shows a large number of genera and subgenera, and a remarkable number of species in some particular genera. A very large proportion of these have been described by Messrs. Melvill and Ponsonby in a series of valuable papers published during the past few years. In quite a recent paper * another 14 new species are described, and probably many more await discovery. Dr. Sturany in his valuable catalogue † enumerates 408 species. A recent

* Ann. and Mag. Nat. Hist., 1899 (ser. 7), vol. iv., pp. 192–200, pl. iii.

† Denk. K. Akad. Wiss. Wien, 1898, Bd. lxvii., pp. 537–642, 3 pls.

summary of these has been given by Mr. E. R. Sykes in the 'Journal of Malacology,' and I give the same below :—

Testacellidæ	2	*Buliminidæ*	24	*Melaniidæ*	4
Streptaxidæ	73	*Pupidæ*	34	*Hydrobiidæ*	6
Rhytididæ	16	*Succineidæ*	9	*Paludinidæ*	2
Vitrinidæ	13	*Vaginulidæ*	4	*Ampullariidæ*	5
Limacidæ	1	*Onchidiidæ*	1	*Assimineidæ*	4
Urocyclidæ	5	*Limnæidæ*	24	*Hydrocenidæ*	1
Zonitidæ	11	*Auriculidæ*	9	*Neritidæ*	3
Helicidæ	78	*Truncatellidæ*	2	*Cyrenidæ*	7
Achatinidæ	49	*Cyclophoridæ*	14	*Unionidæ*	7

Total 408 species.

Of the above 408 species only 16 are slugs. It would be very surprising if in such a region this represented the total number of slug-like forms. From an examination of this collection and others very kindly sent to me by Mr. H. C. Burnup, of Pietermaritzburg, I am of opinion that many new species yet await discovery, and I think there can be little doubt but that future investigations will bring to light a rich and interesting slug-fauna.

Family **LIMACIDÆ**, Leach.

Gen. LIMAX, L.

Limax variegatus, Drp.

Hab. Capetown. Three specimens.

Gen. AMALIA, Moq.-Tand.

Amalia gagates, Drp.

One specimen. Body almost black, foot-sole sepia-coloured.
Hab. Signal Hill. F. Purcell, June, 1896.

Amalia ponsonbyi, n. sp.,

Plate I., figs. 1–2; Plate II., fig. 13.

Animal dorsally a sepia-blue, gradually becoming yellowish laterally and towards the foot-fringe; mantle same as dorsum; groove on mantle well marked. Keel well developed. Rugæ small. Sulci faint, sepia-coloured. Peripodial groove narrow but distinct. Foot-fringe dirty yellow, without lineoles. Foot-sole yellowish, divided into median and lateral planes, the former with transverse markings, the latter with a series of oblique lines running from the centre forwards. Length (in alcohol) 32 mm.

Shell a smooth, nearly ovoid calcareous nodule, slightly broader posteriorly than anteriorly. Major diam. 5, min. diam. 3·2 mm.

Hab. Cape Town. R. M. Lightfoot. Type in collection of South African Museum.

Externally this species is not unlike some forms of *A. gagates*, Drp.; the general form of the generative organs, however, at once separates it from that species. I have much pleasure in associating with it the name of Mr. J. H. Ponsonby.

Generative Organs. There is a single vestibule. The vagina is short. The external form of the sperm-duct is very characteristic; it may be divided into two parts connected by a fine tube (plate II., fig. 13). The lower portion consists of two dilated cavities, the upper of which is the smaller, and from the outer (right) side of this a fine tube opens which is connected with the upper portion; this shows a constriction in the middle, and is connected distally with the vas deferens, a short, narrow tube (plate II., fig. 13, *v.d.*). The receptacular duct is very short, and opens into the vagina on the dorsal side. The receptaculum seminis is a large globular sac lying in life on the dorsal side of the free-oviduct. This latter organ is rather shorter than in *A. gagates*, Drp. The remaining portions call for no special mention.

Gen. AGRIOLIMAX, Mörch.

Agriolimax agrestis, L.

Three specimens.

Hab. Cape Town. R. M. Lightfoot.

Family **TESTACELLIDÆ**, Gray.

Gen. APERA, Heyn.

Apera natalensis, n. sp.

Plate I., figs. 3–4; Plate II., figs. 14–15.

Animal limaciform, subcylindrical, broad posteriorly, tapering anteriorly, dorsally reddish-brown with dark greenish-blue mottling, sides of body orange-red or dark orange with greenish-blue mottling, which becomes scarce towards the peripodial groove. Commencing from the head, the dorsum gradually rises, and at about one-third of the animal's length from the posterior end it slopes downwards,

forming a somewhat spatulate-shaped tail. All the keels are well marked. The radiating lines from the respiratory orifice are very plain, especially those directed posteriorly; the two mid-dorsal ones are also very prominent. Peripodial groove distinct. Generative orifice below and behind the right lower tentacle. Foot-sole orange-red, not differentiated into median and lateral planes. Tail flattened and slightly overlapping the foot-sole, terminating bluntly. Rugæ small. Length (in alcohol) 65 mm.; breadth of foot-sole 9·5 mm.; breadth of dorsum, mid-length, 10 mm., behind respiratory orifice, 13·5 mm.

Shell internal, situated posterior to the respiratory orifice.

Hab. Richmond, Natal. Rev. J. R. Ward, 1899. Type in collection of South African Museum.

This species differs from both *A. gibbonsi*, W. G. Binn., and *A. burnupi*, E. A. Sm., the only two known species of this genus, in a number of particulars. Binney * mentions that the former is "rather slender," and that "the foot is dull opaque white, with a tallowy yellow tint, and with an indistinct bluish streak along middle"; in both of these external features it differs from the species here described. Externally it differs from *A. burnupi* in the colour and general form of the body. As this latter species has not been figured, I here give (plate I., figs. 5–6) two views drawn from an alcoholic specimen very kindly sent to me by Mr. Edgar A. Smith, of the British Museum.

Binney in his original description of the genus (*l. c.* p. 331) correctly states that there is no caudal mucous pore, but in the same paper (p. 358) he refers to the "longitudinal furrows above the margin of the foot, meeting over a caudal mucous pore."

The shell is situated at the most posterior portion of the body behind the pallial organs. In the specimen dissected it was broken up into fragments, but so far as I could judge from these, it is a large solid cap-like structure.

In alcoholic-preserved specimens of *Apera* all the internal parts are exceedingly brittle and contracted, so that probably in fresh material, or if otherwise preserved, they would have a very different appearance. Having only one example of *A. natalensis*, which I wished to preserve as nearly whole as possible, I have only examined the alimentary canal, pedal gland, and generative organs, for purposes of comparison with those organs in *A. burnupi*, E. A. Sm., of which I gave a short description in 1897.†

* Bull. Mus. Comp. Zoöl., Camb., 1879, vol. v., pp. 331-32.

† Ann. and Mag. Nat. Hist., 1897 (ser. 6), vol. xx., pp. 221–25, plate v.

The alimentary canal is very similar to that of *A. burnupi*, excepting that the two salivary glands and ducts are perfectly distinct. The pedal gland (plate II., fig. 14) is much longer but not quite so large in circumference as in *A. burnupi*, it is densely folded and twisted upon itself, and laterally wraps around the viscera. Respecting the generative organs (plate II., fig. 15), there is a small vestibule into which the vagina and penis open, this latter organ is much longer than in *A. burnupi*, otherwise it shows the same simple characters. The free-oviduct is wider and the common duct not so great in length. The most striking difference perhaps is in the form of the receptaculum seminis (plate II., fig. 15, *r.s.*). In this species it is partly covered by the coil of the common duct, for unlike the condition which obtains in *A. burnupi*, it is directed backwards and is perfectly straight. The hermaphrodite duct was so brittle that it broke away in dissection.

Family **ARIONIDÆ**, Gray.

Gen. OOPELTA, Mörch.

Oopelta nigropunctata, Mörch.,

Plate I., figs. 7–8; Plate II., fig. 16.

Animal yellowish-green, lighter laterally. Body marked by a series of oblique, backwardly directed furrows 2–2·5 mm. apart. Mantle oval, granulated, spotted with a series of black dots towards the medium line, sometimes very few. Slight trace of keel. Rugæ small. Peripodial groove distinct. Foot-fringe and foot-sole almost yellow, no lineoles or divisions into median and lateral planes. Length (in alcohol), 50 mm.; mantle, 21 mm.

Hab. Cape Town. R. M. Lightfoot.

I think I am correct in stating that neither the animal or generative organs of this slug have previously been figured. I therefore take this opportunity of giving figures of the same.

Generative Organs. Both vestibule and vagina are small. The sperm duct is a large, exceedingly thick-walled organ. At its distal end it becomes much smaller, and forms a small rounded head with a smaller dilatation into which the vas deferens opens, and on its dorsal side has a short retractor muscle inserted (plate II., fig. 16, *sp. d.*). The vas deferens commences as a very fine tube and lies close to the

ventral wall of the sperm-duct (plate II., fig. 16, *v.d.*) at the point where it makes a turn backwards. Immediately beneath the vagina it becomes much larger and convoluted. The receptaculum seminis has a very short duct, the body itself being somewhat pyriform. The free-oviduct is short and of about equal circumference throughout. The oviducal portion of the common duct is densely folded and short. There is a large albumen gland. The hermaphrodite gland is a small, somewhat triangular-shaped body with a long fine duct.

Oopelta flavescens, n. sp.,

Plate I., figs. 9–10; Plate II., fig. 17.

Animal cream-coloured with a slight bluish-green tint on the posterior portion of mantle. Granulations on mantle prominent, also on rugæ. Oblique, backwardly directed furrows as in preceding species. No trace of a keel. Rugæ small. Peripodial groove distinct. Foot-fringe and foot-sole almost white, no lineoles or divisions into median and lateral planes. Length (in alcohol) 51 mm.; mantle, 22 mm.

Hab. Kalk Bay. F. Purcell, 1896. Four specimens, in collection of South African Museum.

Generative Organs. This species differs from *O. nigropunctata*, Mörch, in not a few important particulars. The vagina is larger than in this last-mentioned species. The sperm-duct is somewhat sickle-shaped (plate II., fig. 17, *sp. d.*); distally it much resembles the previous species. The retractor muscle is longer and broader, particularly at its point of origin. The vas deferens is a long fine tube opening into the distal end of the sperm-duct (plate II., fig. 17, *v.d.*) and lying close to the under side of that organ and on the under side of the vagina; the portion which lies to the left of the vagina is much wider, the width increasing as it approaches the prostatic portion of the common duct (plate II., fig. 17). The duct of the receptaculum seminis is about the same length as the body, which is oval in shape. The free-oviduct is much longer than in *O. nigropunctata*, and it gradually becomes wider as it passes backwards. There is a large albumen gland and a densely convoluted hermaphrodite duct with a bilobed hermaphrodite gland (plate II., fig. 17, *h. gl.*).

Oopelta granulosa, n. sp.,

Plate I., figs. 11–12; Plate II., fig. 18.

Animal brownish-yellow, head and sides of the body anteriorly bluish; granulations on the mantle very pronounced; oblique,

backwardly directed furrows as in *O. nigropunctata*. No trace of a keel. Rugæ small but prominent, giving the whole body a coarse granulated appearance. Peripodial groove distinct. Foot-fringe and foot-sole yellowish-brown, no lineoles or divisions into median and lateral planes. Length (in alcohol), 42 mm.; mantle, 18·5 mm.

Hab. Calvinia Div., Nieuwondtville. C. L. Leipoldt, September, 1898. Three specimens in collection of South African Museum.

Generative Organs. This species differs from either of the preceding species in the shortness of the free-oviduct (plate II., fig. 18, *f. ov.*), the form of the sperm-duct and the shorter common duct. The duct of the receptaculum seminis is slightly longer than that in *O. flavescens*, and the body a little larger. The hermaphrodite duct is densely folded and convoluted, and the gland is very large (plate II., fig. 18, *h. gl.*).

Oopelta, sp.

Hab. Great Winterhoek. Dr. Marloth, December, 1896. Two specimens, in collection of South African Museum.

Possibly these may turn out to be young examples of *O. granulosa*. The body is of a reddish-brown colour and unlike the condition which obtains in *O. granulosa*, the foot-sole is divided into median and lateral planes. The form of the sperm-duct is somewhat like that in *O. granulosa*, and there is a long convoluted vas deferens. Length (in alcohol), 46·5 mm.; mantle, 13·5 mm.

Gen. ARION, Fér.

Arion fuscus, O. F. Müll.

Hab. Cape Town. R. M. Lightfoot.

Seven small specimens, two of which I dissected. The generative organs of both agree with those I have elsewhere figured.*

Family ONCHIDIIDÆ.

Gen. ONCHIDIUM, Buchan. (Em. Plate).

Onchidium peroni, Cuv.

Hab. Green Point. F. Purcell, June, 1896. Eight specimens.

* Proc. Zool. Soc., 1897, p. 443, plate xxx., f. 13, plate xxxi., f. 14.

EXPLANATION OF PLATES.

Plate I.

FIG.

1. *Amalia ponsonbyi*, n. sp., view from the right side. XI.
2. ,, ,, ,, dorsal view. XI.
3. *Apera natalensis*, n. sp., view from the right side. XI.
4. ,, ,, ,, dorsal view. XI.
5. *Apera burnupi*, E. A. Sm., view from the right side. XI.
6. ,, ,, ,, dorsal view. XI.
7. *Oopelta nigropunctata*, Mörch., view from the right side. XI.
8. ,, ,, ,, dorsal view. XI.
9. *Oopelta flavescens*, n. sp., view from the right side. XI.
10. ,, ,, ,, dorsal view. XI.
11. *Oopelta granulosa*, n. sp., view from the right side. XI.
12. ,, ,, ,, dorsal view. XI.

Plate II.

13. *Amalia ponsonbyi*, n. sp., generative organs.
14. *Apera natalensis*, n. sp., the pedal gland, view of from above.
15. ,, ,, ,, generative organs.
16. *Oopelta nigropunctata*, Mörch., generative organs.
17. *Oopelta flavescens*, n. sp., generative organs.
18. *Oopelta granulosa*, n. sp., generative organs.

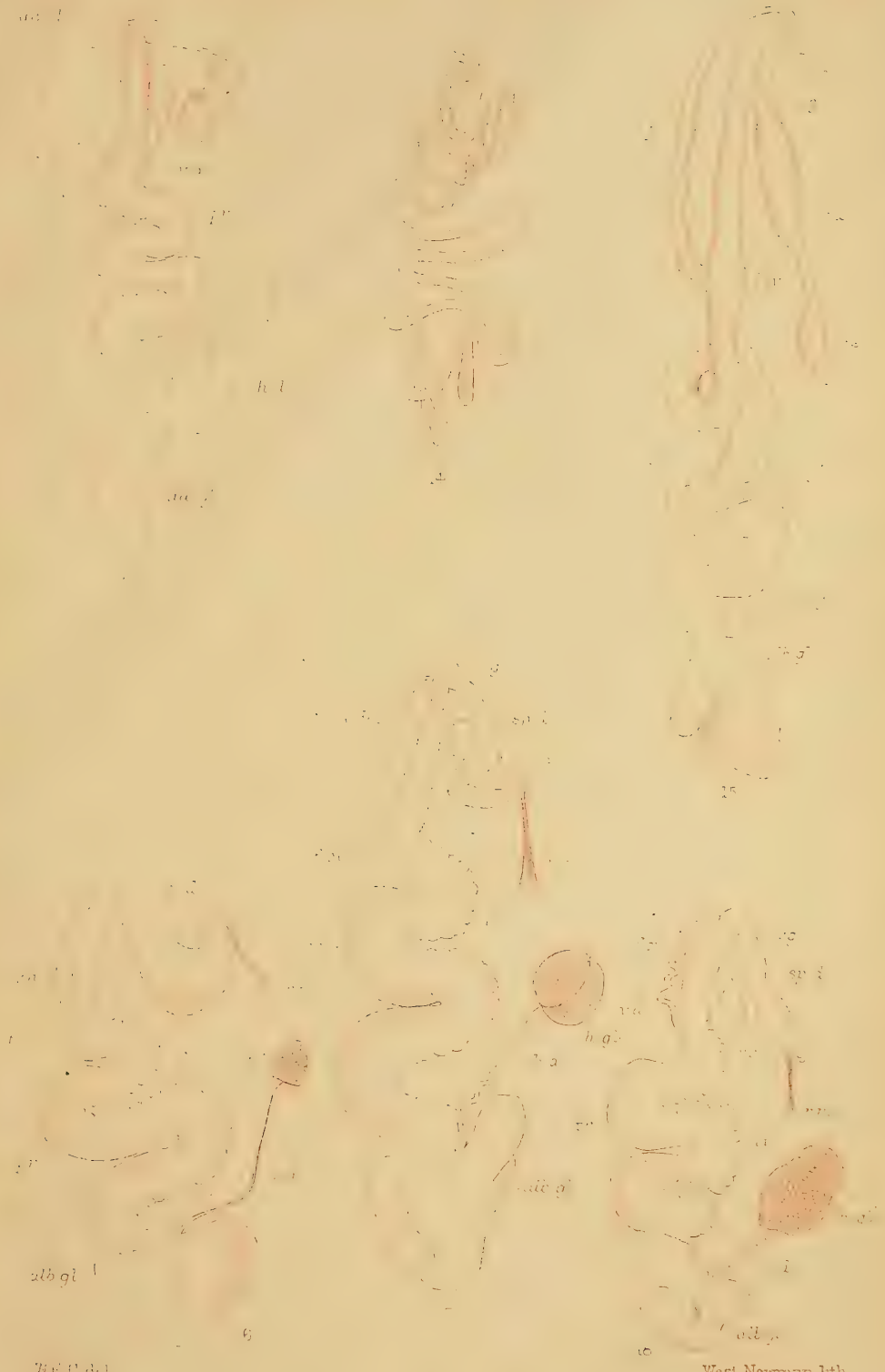
REFERENCE LETTERS.

alb. gl. Albumen gland.
f. ov. Free-oviduct.
h. d. Hermaphrodite duct.
h. gl. Hermaphrodite gland.
ov. Oviduct.
p. Penis.
pr. Prostate.
r. d. Receptacular duct.
r. m. Retractor muscle.
r. s. Receptaculum seminis.
sp. d. Sperm duct.
v. Vestibule.
v. d. Vas deferens.
vg. Vagina.

F.J.Partridge del.ad nat.

West,Newman chromo

South African Moths.



W. & C. del. West, Newman lith.

South African Slugs

II.—*The Meteoric Irons from Griqualand East, South Africa.*—

By Prof. E. Cohen, *Greifswald.*

(Plates III., IV., V.)

The larger of the two irons here described has been in the South African Museum since December, 1885. It is mentioned in the Report of the Trustees for that year as "a very large iron meteorite of singular form and weighing 560 lbs.," presented by Mr. C. P. Watermeyer. The weight so given is, however, inaccurate, as before the piece, on which the following description is mainly based, was cut off, the weight was found to be 657 lbs. (298 kg.)

From the records in the Museum and inquiries made by Dr. Corstorphine, it appears that two masses of iron were originally brought to the Museum through the agency of Mr. Watermeyer. From the correspondence they clearly were both brought from Kokstad, but their earlier association is not so evident. The larger piece, now in Cape Town, was known to the Rev. C. D. Tonkin, a former missionary at Matatiela, in 1878. He mentions it (in a MS. in the South African Museum, dated St. Andrews, Pondoland East, April 7, 1885) as having lain at a Basuto kraal, the headman of which informed him that it had been found on a neighbouring hill. One of the late Mr. Watermeyer's nephews remembers being told by his uncle that this meteorite was found buried in the soil on a kopje at the junction of the Mabele and Kenegha rivers, about one hour from Matatiela, towards Ongeluk's Nek in the Drakensbergen.

The history of the smaller iron, now in Vienna, is somewhat more vague. A Mr. H. L. Rudlin, who wrote to the Curator of the South African Museum in April 1885, enclosing the account

of the larger iron written by Mr. Tonkin, mentions "two smaller (meteorites) taken in to Kokstad at the same time," as the larger one.

The one of these, which later came to Cape Town, was, at the written request of Mr. Watermeyer, given to Prof. P. D. Hahn, South African College, who ultimately forwarded it to the Hofmuseum, Vienna. This iron, weighing 43 kg., was recorded first by Brezina in 1887, who gives Kokstad as the locality, 1884 as the date of its discovery, and mentions especially the jaw-bone-like shape. This he regards as representing the final stage in the explosion of a ring-shaped mass, and compares it to the Signet iron ring (Tucson Ainsa ring, Muchachos) which might, on bursting, have yielded two pieces, one of which would have had exactly the shape of the Kokstad iron.* In the following year Brezina describes a hemispherical cavity, 7 cm. in diameter, visible on the surface of the iron, as due probably to the falling out of a huge troilite nodule.†

Later, in 1894, Brezina published a reproduction of the meteorite, and mentioned the enormous abundance of minute troilite grains.‡ In 1895 he classed the Kokstad iron among the "Octahedral Irons with lamellæ of medium width," and briefly described the Widmanstätten figures: "Lamellæ rarely closely joined together (geschart), with rounded ends (wulstig); kamacite hatched (schraffirt) with orientated sheen; taenite moderately developed; fields numerous and small, filled with dark grey plessite or half-shaded central skeletons." §

In 1891 Dr. Weinschenk, of Munich, and I examined portions of the oxidised crust, and found it to contain chlorine and silicate grains, among which, as usual, a colourless quartz-like substance predominated. The material was not suitable for further examination.||

The South African Museum specimen, which originally weighed 657 lbs. (298 kg.), is known to me only from photographs and from a piece weighing $\frac{3}{5}$ kg., which Dr. Corstorphine sent me for examination. This piece I have had cut into eight slices.

* Neue Meteoriten des k.k. naturhistorischen Hofmuseums. Verh. der k.k. geolog. Reichsanstalt 1887, 289.

† Annalen des k.k. naturhistorischen Hofmuseums, 1888, iii. Not. 42.

‡ Die Gestaltung der Meteoriten. Schriften des Vereins zur Verbreitung naturwiss. Kenntnisse in Wien, 1894, xxxiv. 269–270.

§ Die Meteoritensammlung des k.k. naturhistorischen Hofmuseums am 1 Mai, 1895. Ann. des k.k. naturhist. Hofmuseums, 1896, x. 284.

|| Meteoreisen-Studien. Ib. 1891, vi. 159.

One of the photographs (Plate IV.) shows that this iron also is of a more or less jaw-bone-like shape, with, in this position, a maximum length of 93 cm. In another position the iron presents the appearance of a highly arched tortoise with head and neck well extended (Plate III.). The general shape is, however, irregular, owing to the presence of numerous indentations, of varying size and depth, and of projections ranging from rounded knobs to sharply angular points. Hemispherical cavities, due probably to the fusion or the falling out of troilite nodules, are present in considerable number, in one place an actual perforation having thus been formed. From the appearance

Fig. 1. The Vienna specimen from Kokstad. ($\frac{1}{3}$ Nat. Size.)

of the surface it is evident that a good deal of oxidation has taken place, the rusted material having either fallen off or been artificially removed. This supposition is borne out by the fact that the typical finger-like depressions and bowl-like pittings are now represented by mere shallow hollows, while on many places Widmanstätten figures are visible. The latter fact likewise suggests that the iron is easily oxidized.

The shape of this mass favours the view that it also is to be regarded as a portion of a large ring-shaped iron, and that it and the Vienna piece are fragments of one meteorite. The fact that the Vienna mass (Fig. 1 *), the shape of which may be compared to that of a compressed ham, is much flatter, and has more even surfaces can hardly be urged as an objection to this view, since the Tucson Ainsa ring (Fig. 2), to which Brezina compared it, would also, on bursting, have yielded pieces of very different shape. Besides, the unlikelihood of such a rare occurrence as the ring form having

* The wood-block for Fig. 1 has been kindly lent by Dr. Brezina

appeared in two different meteorites in one locality may be reasonably regarded as additional support for the view that the two pieces had a common origin.

In attempting to reproduce the original shape of this hypothetical meteorite, and to explain the mode of bursting, as far as can be inferred from a model of the Vienna specimen and the three photographs of the Cape Town one which are in front of me, I may, for comparison, make use of the Tucson Ainsa ring.

From a consideration of the measurements alone, and for this purpose I ignore the weights, the lower left quarter of the Tucson

FIG. 2. The Tucson Ainsa Ring. ($\frac{1}{20}$ Nat. Size.)

Ainsa ring would give a piece like that in Vienna; the portion to the right—about three-eighths of the ring—would correspond to the irregular block in Cape Town, while the remaining three-eighths forming the thinnest part of the ring are wanting.* The hypothetical ring thus completed would have a diameter of about 1 metre.

The above hypothesis, based, as stated above, on the shape and common locality of the two irons, is, however, contradicted by their structure. Although both belong to the "Octahedral Irons with lamellæ of medium width," still the description of the appearances presented by the etched surfaces will show that important differences in structure exist, and I shall have, in conclusion, to return to the above question.

* It is unfortunate that nothing can be learned of the second of the two smaller pieces mentioned by Mr. H. L. Rudlin, for it may be part of the missing portion.

A.—*The Iron from "Kokstad" in the Vienna Collection.*

For examination I have had at my disposal two slices weighing 163 and 54 grams, with cut surfaces of 51 and 18 sq. cm. respectively, the larger being the property of the Hofmuseum, Vienna, and the smaller of Greifswald University.

Especially characteristic is the occurrence of the kamacite in two different types. One portion of this mineral occurs mainly in straight-lined beams, which, frequently joined closely together, and arranged parallel to the octahedral faces, attain a length of 2·5 cm.; less frequently it occurs in small round-ended lamellæ which seem to be irregularly arranged. This form, when etched, assumes an uneven surface and gives in consequence a dull orientated shimmer. Seen through a hand lens the surface shows a fine-grained structure, but, viewed by higher powers, it is seen that the unevenness is due to numerous fine etching-hollows and etching-lines. The latter are usually gently undulating and sometimes so arranged in parallel lines as to give the beams a striped appearance.

The other less abundant type of kamacite occurs in short lamellæ with highly rounded ends which are never closely joined together. The lamellæ are generally 1–2 mm., exceptionally 1 cm., long; they assume an evenly etched surface with a very strong orientated sheen and show few somewhat indistinct Neumann lines ("schwach schraffirter Kamazit"). The larger lamellæ lie parallel to the octahedral faces, the shorter are as irregularly arranged as the shorter lamellæ of the first type of kamacite, and, with these, form apparently irregular groups which cover nearly half of the surface of the slice. Not infrequently all kinds of kamacite—especially the short, stubby types—are intimately intergrown to form what is seemingly *one* lamella composed of dull, and of glittering grains. Owing to the marked differences in the strength of their lustre, the various beams stand out sharply from one another, and from this, as well as from their varying size and arrangement, produce on the etched surface a peculiar broken appearance such as I know on no other octahedral iron (see Plate V., Fig. 1). Taenite is very poorly developed. The fields are small but numerous, and consist of remarkably dark, finely granular plessite, in the centre of which strongly lustrous flakes are often massed together; "combs" are always quite isolated.

The Greifswald slice, which comes directly from the surface of the block and is covered on one side by a portion of the oxidized crust, differs from the Vienna piece just described, in having the strongly

lustrous lamellæ with evenly etched surface more developed, and only slightly, or not at all, cross-hatched. In consequence of the markedly roundish (wulstig) form of these lamellæ their arrangement parallel to the octahedral faces appears less distinct.

Both slices are wonderfully poor in accessory constituents, small schreibersite-like granules or scales being alone present. As there is no visible troilite and the analysis gives only a trace of sulphur, while Brezina accentuates "the enormous wealth of Troilite grains" the distribution of this iron sulphide must, as often happens, be extremely unequal.

The analysis made by Dr. J. Fahrenhorst gave the results * shown in columns I.–I.*c*. No residue was obtained after solution in *aqua regia*. I.*d* gives the total composition. I.*e* shows the composition after removal of the iron-nickel-phosphide (Fe_2NiP) and the ferrous chloride ($FeCl_2$).

	I.	I.*a*	I.*b*	I.*c*	I.*d*	I.*e*
Weight in grams of material used	0·8592	5·2120	5·2769	5·2586	...	...
Fe	91·21	...	...	...	91·21	91·61
Ni	8·01	...	...	...	8·01	7·73
Co	0·63	...	...	...	0·63	0·61
Cu	...	0·018	...	...	0·02	0·02
Cr	...	0·00	...	...	0·00	0·00
C	...	...	0·031	...	0·03	0·03
Cl	...	...	...	0·053	0·05	...
P	0·22	...	...	...	0·22	...
S	...	0·003	...	...	trace	...
					100·17	100·00

Accordingly, assuming chlorine and iron to be combined as the so-called lawrencite, the mineralogical composition of the piece analysed is :—

Nickel-iron	98·47
Schreibersite	1·43
Troilite	0·01
Lawrencite	0·09
	100·00

* For the methods employed in the analysis see : O. Sjöström, Die chemische Untersuchung der Meteoreisen. Mitth. aus dem naturwiss. Verein für Neu-Vorpommern u. Rügen, 1898, xxx. 1–29.

The sp. gr. was determined by Dr. W. Leick as 7·7876 (temp. 14½° C.), the weight of the piece being 162·954 grams. From this, and taking the accessory constituents into consideration, the sp. gr. of the nickel-iron is 7·8137.*

B.—*The Iron from Matatiela in the South African Museum.*

For investigation of the South African Museum specimen I had at my disposal eight slices, weighing in all 388 grams and having a total cut surface of 153 sq. cm.

The beams here reach 4 cm. in length, are only slightly rounded at the ends, and show Neumann lines † very distinctly ("schraffirter Kamazit"), as well as etching-hollows in varying numbers. On slight etching the lines often appear alone, on stronger etching the hollows become more numerous and may finally, to some extent, conceal the lines. Frequently several beams lie close together; they rarely touch directly, being more usually separated by much elongated particles of plessite, which are often so narrow as to be easily overlooked. The beams are distinguished by a marked orientated sheen which is common, sometimes to alternate beams, sometimes to each of a continuous group of these.

Taenite is poorly developed and is recognisable with certainty only after somewhat strong etching. The fields are numerous, attaining a maximum area of 0·5 sq. cm. and showing great variation in dimensions, form, and structure. The smaller are frequently narrow, elongated, and very dark, the larger are fairly isometric and of a light grey colour. "Combs" proper, that is, continuous growth of the taenite surrounding the beams, are rare, and are limited chiefly to narrow marginal areas. On the other hand, many of the larger fields are regularly interstrewn with slightly bent, strongly lustrous taenite-like scales of about 0·01 mm. in thickness. These scales attain a maximum length of about 0·04 mm., but are usually much shorter; they are arranged parallel to the octahedral planes and follow one another at intervals of from 0·02 mm. to 0·2 mm. Possibly we have here net-shaped, perforated, larger lamellæ of taenite with the meshes filled in with kamacite. The lighter or darker colour of the plessite appears entirely, or almost entirely, dependent on the number of the above-mentioned scales. Some of these fields are

* The following specific gravities were taken as bases for calculation: Iron-nickel-phosphide 7·1118, Troilite 4·75, Ferrous chloride 2·528 (after Filhol).

† The etched surface reproduced in Plate V., Fig. 2 is intended to show the general and not the minute structure, and it shows the Neumann lines distinctly in the bars towards the left edge only.

broken up into several divisions, each of which gives a uniform but independently orientated shimmer. The sheen is caused by fine etching-lines which pass continuously across each division, uninterrupted by the intervening lines of glittering scales described above.

Such a field may therefore be regarded as built up of a few larger separate pieces of kamacite. Other fields are composed of bundles of small, apparently granular bands, which seem to be arranged parallel to the octahedral faces. The minute structure reminds one of that of the meteorite as a whole, with the difference, however, that the small beams are not surrounded by taenite, which, so far as can be seen, occurs only in isolated scales. Fine-grained plessite, enclosing strongly lustrous scales of quite microscopic size, forms the majority of the small fields, some of which, however, have in addition a narrow border of delicate combs.

Apart from differences in detail the general structure, as is well shown in Fig. 2, Plate V., reminds one greatly of the Toluca iron.

The eight slices which I examined are distinguished by great poverty in accessory constituents. Troilite is limited to isolated grains of 1·5 mm. maximum diameter. On these, however, in spite of their minute size, delicate intergrowths with schreibersite and a black mineral can sometimes be recognised even with a hand lens. From the mere appearance one cannot determine whether the black mineral is daubréelite or graphite, and the particles are too small to allow a hardness determination ; but the absence of chromium and the comparatively high carbon percentage shown in the analysis, point to its being graphite. Schreibersite occurs in addition only in very small particles which are especially found squeezed in between the beams. Under the microscope small glittering rods, probably of rhabdite, are occasionally seen in the plessite.

No trace of an alteration zone can be seen ; however, as is stated above, a considerable amount of rusting has most probably occurred. Fine veins filled with the so-called "Eisenglas" sometimes pass inward from the exterior, and small rust spots readily form in the vicinity of these, though elsewhere the nickel-iron shows no tendency to rust.

The analysis made by Dr. J. Fahrenhorst gave the results shown in columns II.–II.*e*. On solution in *aqua regia* a minute residue was obtained (graphite ?). II.*f* gives the total composition, II.*g* the composition of the nickel-iron after deducting the iron-nickel-phosphide (Fe_2NiP), the iron-sulphide (FeS), and the ferrous chloride ($FeCl_2$).

	II.	II.*a*	II.*b*	II.*c*	II.*d*	II.*e*	II.*f*	II.*g*
Weight in grams of material used	0·6886	10·4138	3·9021	5·0768	1·9510	6·5428	...	...
Fe	92·20	...	...	...	...	...	92·20	92·21
Ni	7·30	...	...	...	...	...	7·30	7·03
Co	0·67	...	...	...	...	...	0·67	0·65
Cu	...	0·032	...	...	...	...	0·03	0·03
Cr	...	...	0·00	...	...	...	0·00	0.00
C	...	...	...	0·083*	...	...	0·08	0·08
Cl	...	...	...	...	...	0·0253	0·03	...
P	0·20	...	...	...	0·18	...	0·19	...
S	...	...	0·027	...	...	...	0·03	...
							100·53	100·00

Assuming iron and chlorine to be combined as the so-called lawrencite, the mineralogical composition of the piece analysed would thus be:—

Nickel-iron	98·64
Iron-nickel-phosphide	1·23
Troilite	0·08
Lawrencite	0·05
	100·00

Dr. W. Leick determined the sp. gr. of three different slices as:—

1. 7·7852 temp. 15° C. (wt. of slice 25·300 grams).
2. 7·8195 „ 15⅓° C. („ 38·983 „).
3. 7·8206 „ 14½° C. („ 119·275 „).

The differences may be due either to varying amounts of accessory constituents or to the fact that the kamacite, taenite, and plessite are not necessarily equally, but most probably generally unequally distributed,† especially when the comparison is between slices of small dimensions. The mean of the above determinations is 7·8084, or for the nickel-iron, after deducting the accessory constituents, 7·8303.

* As the carbon percentage is unusually high, a second control determination was made from a piece weighing 3·3560 grams, and yielded exactly the same result.

† Already directly proven by the author in the case of the iron from Glorieta Mountain. Meteoreisen-Studien II. Ann. des. k.k. naturhist. Hofmuseums, 1892 vii. 145.

To allow convenient comparison, the analyses of the two specimens are given here together :—

	Vienna.	Cape Town.
	I.*d*	II.*f*
Fe	91·21	92·20
Ni	8·01	7·30
Co	0·63	0·67
Cu	0·02	0·03
C	0·03	0·08
Cl	0·05	0·03
P	0·22	0·19
S	trace	0·03
	100·17	100·53
Sp. gr.	7·7876	7·8084

	I.*e*	II.*g*
Fe	91·61	92·21
Ni	7·73	7·03
Co	0·61	0·65
Cu	0·02	0·03
C	0·03	0·08
	100·00	100·00
Sp. gr.	7·8137	7·8303

Since, as already stated, the relative amounts of kamacite, taenite, and plessite occurring throughout an octahedral iron are not usually constant, the differences in chemical composition shown in the above tables are not so great as to exclude the possibility of the two specimens belonging to one meteorite. On the other hand, as will be learned from the descriptions, and seen at once by a comparison of the reproductions of the etched surfaces given on Plate V.,* the two blocks differ more in structure than has yet been observed in any single octahedral iron. So far as our present experience allows, we can, therefore, scarcely assume, without further proof, that these two irons are of common origin, but must rather wait until similar structural differences have been found coexistent in an undoubted single fall.† This reserve appears the more necessary since the

* As the slices were inclined so as to secure better illumination, the vertical and horizontal reductions are not equal—the former being about $\frac{6}{7}$, the latter about $\frac{12}{13}$ of the real size.

† In the iron from Forsyth Co. I found one part compact and another finely granular, but this after all is but a difference in texture, and not as here a thoroughgoing difference in the actual structure. Das Meteoreisen von Forsyth Co., Georgia, Vereinigte Staaten. Sitz. Ber. der k. preuss. Akad. d. Wissensch. zu Berlin 1897, 386–396.

actual records, now available as to the two irons, give no definite history of the Vienna iron previous to its arrival in Kokstad. It is probable that it too came from the kraal at Matatiela, but against this there is the fact that the missionary, Mr. Tonkin, mentions the larger block only as being there on his visit. But even if the two pieces were brought from the kraal, there still remains the possibility that the smaller was not found originally at the same locality as the larger. For the present it may be as well to distinguish the two irons by retaining "Kokstad" as the locality for the Vienna specimen, and assigning "Matatiela" to that in Cape Town. Those, however, who prefer to give more weight to the similarity in shape, and the proximity of the localities, rather than to what I regard as very serious structural differences, may include both masses under "Matatiela" or "Kokstad."

EXPLANATION OF PLATES.

PLATE III.—View of the most regular surface of the Cape Town specimen. (See p. 11.)

PLATE IV.—View of the iron resting on the surface shown in Plate III. (See p. 11.)

PLATE V, Fig. 1.—Polished and etched slice of the Vienna specimen. (See p. 13.)

,, Fig. 2.—Polished and etched slice of the Cape Town specimen. (See pp. 15 and 16.)

Matatiela (Kokstad) Meteorite.
$^{2}/_{15}$ *nat. size.*

Matatiela (Kokstad) Meteorite.

$^{2}/_{15}$ *nat. size.*

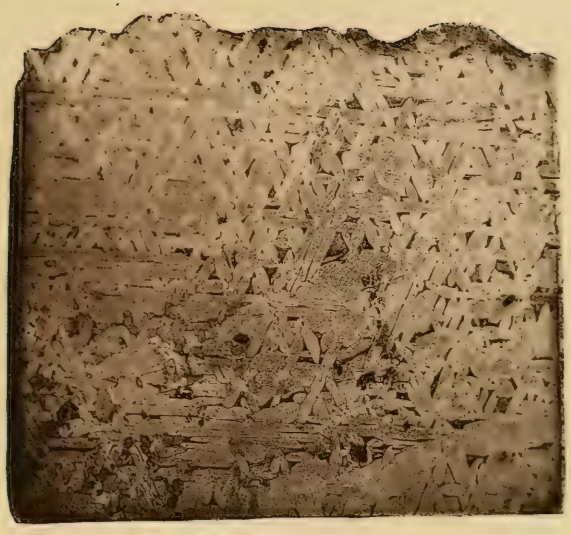


Fig. 1.

Fig. 2.

1. The Iron from Kokstad in the Vienna Museum.
2. The Iron from Matatiela near Kokstad in the South African Museum.

III.—*The Meteoric Iron from Bethany, Great Namaqualand.*—

By Prof. E. Cohen, *Greifswald.*

(Plates VI., VII., VIII., IX.)

The iron here described was known for a long time to the missionaries settled at Bethany, in Great Namaqualand.* It was brought as far south as the Orange River, and, after a considerable delay, ultimately taken to Cape Town and lodged in the South African Museum by Mr. John Wild in 1860. When the *Challenger* Expedition was in Cape Town (1873) the Curator of the Museum allowed a piece weighing 1,440 grams to be cut off and taken to the British Museum. This piece is given in Mr. Fletcher's Catalogue under the number 34. Less this piece, the block weighed 508 English lbs. (230·4 kgs.), from which must now be deducted the 5 lbs. removed for the present investigation.

In the various meteorite catalogues a number of other irons from South-West Africa are mentioned, and much difference of opinion prevails as to what relationship, if any, exists between them. The following list gives the chief ones :—

1. British Museum Catalogue † :—
   - (*a*) Great Fish River (east bank of).
   - (*b*) Springbok River, Namaqualand.
   - (*c*) Lion River, Great Namaqualand.
   - (*d*) Orange River, South Africa.
2. Tübingen Collection ‡ :—
   Cabaya, Grosser Fischfluss.
3. Göttingen Collection :—
   A specimen with Blumenbach's label "Von einer am grossen Fischflusse in Südafrika gefundenen Eisenmasse."

* This name has, according to English usage, been retained throughout the text, but the more correct "Namaland" had been printed on the plates prepared under Prof. Cohen's directions.—Ed. Ann. S. A. Mus.

† An introduction to the study of meteorites, with a list of the meteorites represented in the Collection, p. 57. London, 1896.

‡ A. Brezina, Die Meteoritensammlung des k.k. naturhistorischen Hofmuseums am 1 Mai 1895. Ann. des k.k. naturhist. Hofmuseums, 1895, x. 329.

Fletcher regards the four first-named and the iron here described as five independent occurrences; he adds, however, "Some of the above Namaqualand masses may have been transported from the same locality." Wülfing takes Great Namaqualand, Great Fish River, and Springbok River as being the same.* Brezina unites those from Great Namaqualand and Great Fish River only, while from the evidence afforded by a specimen in the Siemaschko Collection, he unites those from Springbok River and Orange River.† Gregory, on the contrary, states that his own specimen from Springbok River is very like that from Lion River, which, however, does not necessarily imply that they are the same.‡

The iron labelled "Cabaya, grosser Fischfluss," in the Tübingen Collection, which was kindly sent to me for inspection by Professor Koken, turns out to be a pseudo-meteorite, with a structure, however, which does not essentially differ from that of some meteorites. On etching, the cut surface (3 sq. cm.) resolves into angular, sharply defined grains, with a system of deep etching-lines which resemble those of Neumann, and produce a strong orientated sheen on the alternating groups of grains. This iron therefore resembles those hexahedral irons which consist of an aggregate of hexahedral grains.§ It has already been compared by Brezina with those portions of the Hollands Store iron characterised by a finely granular structure, though he also adds the remark, "May it not be pig iron?" || This query induced me to break off a small piece and test it for nickel. As not even a trace of this metal was found, I am forced to regard the substance as an artificial product. This specimen is interesting as showing that mere examination of the structure does not always suffice to distinguish artificial from meteoric iron. Reichenbach, who had no doubt as to its meteoric origin, laid stress on the orientated sheen of the grains as well as on the absence of needles and "combs" in the plessite." ¶

The Göttingen specimen, catalogued as from the Great Fish River, was generously placed at my disposal by Professor Liebisch, and proved on etching to be a piece of the Cape of Good Hope iron (1793)

* Die Meteoriten in Sammlungen und ihre Literatur nebst einem Versuch den Tauschwert der Meteoriten zu bestimmen, 131–132. Tübingen, 1897.

† *L.c.*, 277, 348, and 357.

‡ Catalogue of the Collection of Meteorites of James R. Gregory, of London, p. 17. London, 1889.

§ Quenstedt gives a somewhat diagrammatic reproduction of the etched surface. (Klar und Wahr, 315. Tübingen, 1872.)

|| *L.c.*, 329.

¶ Über die nähern Bestandtheile des Meteoreisens. Pogg. Ann. d. Physik u. Chemie, 1861, cxiv. 273; 1862, cxv. 150 and 155.

The Great Fish River was first mentioned by Captain Alexander as a meteorite locality. According to him, great masses of iron were strewn over a considerable area on the east bank.* One piece which he brought home was examined by John Herschel, who described it as being tough, very malleable, with little tendency to rust, and lighter than ordinary iron. Herschel determined the amount of nickel as 4·61 per cent., and was of opinion that the mass had been molten and had exploded in the air.† In a lecture to the Geographical Society, London, Captain Alexander defined his locality more exactly as north-east of Bethany, not far from the Great Fish River.‡ It is therefore very probable that the iron brought to Europe by Captain Alexander and the block in the South African Museum, known to have lain on the mountains between Bethany and Berseba, belong to the same fall. This point could be easily decided by comparing the pieces in the British Museum. In this connection it may be interesting to note that Boguslawski considered the Great Fish River and the Cape of Good Hope irons as being probably identical,§ a view which their radical differences renders quite untenable.

That the Lion River and the Orange River irons are quite distinct there can be no doubt, as they differ entirely in structure: the former, according to Brezina, showing fine, the latter medium, octahedral lamellæ, and neither has resemblance to the South African Museum block from Bethany.

As to the Springbok River irons, I have not been able to find any other data, but here also comparison may be able to decide whether they represent independent falls or not. The two specimens in the Siemaschko and Gregory Collections are certainly doubtful. The piece (·5 gram) in the Museum d'Histoire Naturelle is too small to be taken into consideration. Meunier states that it gives no Widmanstätten figures on etching, and is too minute for further examination.|| There further remains doubt also as to the Spring-

* An expedition of discovery into the interior of Africa through the hitherto undescribed countries of the Great Namáquas, Boschmans, and Hill Dámaras. Vol. ii. Appendix, 272–275. London, 1838.

† Notice of a chemical examination of a specimen of native iron from the east bank of the Great Fish River in South Africa. Phil. Mag., 1839, (3) xiv. 32–34.

‡ Report of an expedition of discovery through the countries of the Great Namáquas, Boschmans, and the Hill Dámaras in South Africa. Journ. of the R. Geogr. Soc. of London, 1838, viii. 24.

§ Zehnter Nachtrag zu Chladnis Verzeichnisse der Feuermeteore und herabgefallenen Massen. Pogg. Ann. d. Physik. u. Chemie, 1854, Erg.-Bd. iv. 398.

|| Revision des fers météoriques de la collection du Muséum d'Histoire Naturelle. Bull. de la Soc. d'Hist. Nat. d'Autun, 1893, vi. 74.

bok River specimens in the British Museum* and Bement's† Collection.

It follows therefore that three only of these localities—Great Namaqualand, Orange River, and Lion River—can be regarded as yielding separate irons.‡ Cabaya, given for the Tübingen specimen, and Great Fish River for the one in Göttingen, must be abandoned; Springbok River is doubtful, while Namaqualand as given for the Cape Town specimen and Captain Alexander's Great Fish River are probably identical.

Great Namaqualand being a somewhat extensive region, it is desirable that a less vague local name be attached to the iron here described. It will also avoid confusion with the Great Fish River and Orange River irons which already appear in the literature under "Great Namaqualand" if, as in the title, the designation 'Bethany, Great Namaqualand," be adopted. Even when, as I conjecture, the identity of Captain Alexander's iron and that in Cape Town is proven, this name will still remain more correct, since Alexander himself has stated that his specimen was found near Bethany, and "Great Fish River" is nearly as indefinite a designation as "Great Namaqualand."

In the two photographs sent by Professor Corstorphine the Bethany iron shows a rounded form. One view presents a surface closely covered with depressions, which, however, appear to have been reduced by the exfoliation caused by rusting (Plate VI.); the other view shows a surface less rounded and with fewer indentations, but these are, at least in part, much deeper, and are confined to a narrow central zone (Plate VII.).

Of the meteorite itself I had for examination ten slices, weighing together 1,590 grams, and having a total polished surface of 480 sq. cm., five having each from 60–75 sq. cm.

Of the larger slices not one remains uniform after etching, but all

* Fletcher in his catalogue simply states that the piece came from the Burkart Collection.

† Fourth rough list of meteorites. Philadelphia, 1897.

‡ After the above lines had been printed, I had occasion to compare some pieces from Lion River in Vienna. Those in the Hofmuseum are really rather different from the South African Museum mass from Bethany; but a slice in the collection of Dr. Brezina shows the same development of Plessite as the latter iron, so that I am now convinced that Lion River described by Shepard (Notice of meteoric iron near Lion River, Great Namaqualand, South Africa. Am. Journ. of Science, 1853, (2) xv. 1–4) belongs to the same fall as Bethany. Accordingly there only remain Orange River and Bethany as proved different falls from South-West Africa.

divide into two portions, showing a considerable degree of structural difference. One portion shows the normal structure of a finely lamellar octahedral iron. The width of the lamellæ rarely exceeds 0·33 mm.; the beams are only now and then rounded at the ends, and sometimes occur isolated, sometimes congregated together. The kamacite is so finely hatched that the etching-lines and hollows and the fine taenite borders are first distinctly seen on microscopic examination, and it is only where a fourth lamella coincides with the plane of section and has been preserved, that numerous and distinct etching-lines become visible to the unaided eye. Granular structure is wanting, or but slightly indicated.

The well-developed fields which form quite half of this portion of the surface are of very varying size and formation. The smaller ones appear, as a rule, almost black, and even when viewed through a hand-lens, uniformly dull, homogeneous, and compact. On stronger magnification, however, numerous delicate, lustrous spangles and a fine-grained structure become apparent. This variety of plessite is most easily affected by etching. Its dimensions rarely exceed a few millimetres, and it therefore plays but an unimportant part in the composition of the iron; still, its colour being considerably darker than the rest of the nickel-iron, it shows up very clearly. On Plate VIII. this is not the case, as some of the beams there appear quite as dark as the plessite, but by aid of a lens places showing the differentiation are easily discovered, especially on Fig. 1. On the enlarged reproduction (Plate IX., Fig. 1) the dark plessite stands out clearly at many places on the periphery, where the mottled appearance also indicates the fine-grained structure.

Of the larger fields, some are composed of irregular grains 0·03 to 0·2 mm. in size (Plate IX., Fig. 1), and on favourable etching, groups of these show a strong, similarly orientated, sheen. The sheen may be caused by etching-hollows, for stronger magnification in reflected light reveals numerous minute lustrous specks. I think I have also occasionally noticed a few etching-lines, but it is difficult to feel certain of these, and I have similar uncertainty as to the nature of an extremely fine taenite-like sheath. As a rule the grains with their doubtful sheaths lie close together, but occasionally one comes across dark, dull particles of from 0·02 to 0·05 mm. wedged in between them, which closely resemble the first-mentioned plessite. Similar fields were described and figured by Tschermak * as being in the iron from Ilimaë (the same as Juncal according to Brezina).

* Ein Meteoreisen aus der Wüste Atacama. Denkschriften d. Mathem. Naturwiss. Classe d. Wiener Akad d. Wissensch., 1871, xxxi. i. p. 193. Tf. IV., Fig. 6.

A third series of fields differs from the last-mentioned in showing, instead of these grains, small rods with rounded ends, which reach 0·2 mm. in width, and are also apparently separated by a border of taenite. As the diameter of the grains coincides with the width of these rods, it may be that we are, in the two cases, dealing merely with variations in the direction of section. On the other hand, however, the frequent occurrence of the granular plessite and the comparative scarcity of the rod-like variety, as well as the absence of distinct transition forms, tell against this conjecture. Finally, there are other fields which consist half of the one, half of the other kind of plessite. As to the identity of the small grains and rods with the larger bars there can be no doubt. Moreover, it is now generally assumed that plessite is not an independent alloy of nickel and iron, but that it consists sometimes of kamacite only, sometimes of kamacite and taenite in very varying proportions, and it is noteworthy that this Bethany iron affords more conclusive evidence for this view than is usually the case.

Other portions of the etched plates on general view assume a banded appearance. The bands attain a maximum width of 5·5 cm., and are bounded by lines parallel to the octahedral faces, so that the octahedral structure is preserved. In reflected light alternate bands give a similar and uniform sheen, so that the whole appears homogeneous to the unaided eye. On the boundary of the normally developed portions of the surfaces there is a gradual passage from isolated lamellæ, lying parallel to the traces of three different octahedral planes, to others which are grouped together until they come to cross one another, and enclose small fields in the usual fashion.

All these phenomena are distinctly shown on Figs. 1 and 2, Plate VIII.

If one examines the homogeneous-looking bands mentioned above with a lens, or, better still, with the microscope, one sees that they include numerous fine taenite-like scales. These vary much in length, and are about 0·02 to 0·03 mm. wide. They divide the bands into anastomosing strips of from 0·07 to 0·25 mm. in width (Plate VIII., Fig. 2). These are not small beams, for they are not completely separated, each portion not being fully surrounded by taenite. The nickel-iron lying between the taenite-like scales shows etching-lines and hollows. On favourable etching one may see that these lines run in three directions, and abut upon the delicate scales, to continue undisturbed, however, on the other side of them. When viewed at such a distance that the finer details are lost, such portions

resemble the etched surface of a hexahedral iron. With a lens one may see indications of these lines on Fig. 1, Plate VIII. Further, the nickel-iron after etching has a spotted appearance, which can be distinctly seen in the enlarged reproduction, Fig. 2, Plate IX. The spots have indistinct boundaries, and do not, in my opinion, indicate a granular structure, which is likewise contradicted by the continuous etching-lines.

The main mass of the nickel-iron is undoubtedly kamacite, each broad strip of which may be regarded as forming a simple individual intimately intergrown with taenite. The mode of intergrowth may be best compared with the micro-pegmatitic structure of terrestrial rocks, in which case one may also regard the taenite as forming a simple net-like individual. This cannot be conclusively proved, but it appears to me to be not unlikely.

In my opinion the broad strips cannot be compared with the bars in octahedral irons with very wide lamellæ, as these never show an intergrowth of kamacite and taenite, but always single kamacite individuals surrounded by taenite. On the other hand, this doubtful portion of the iron resembles in its structure the third variety of plessite, described above as being apparently built up of rods. I conclude, therefore, that the broad strips are best regarded as consisting of plessite, which as a rule is composed of intimately intergrown kamacite and taenite. We may therefore regard this iron as being in certain ways analogous to that from Butler, Bates Co. Both irons agree in having an unusually large proportion of plessite, but they differ in structure and in arrangement of their lamellæ. In the Butler iron these are fairly evenly distributed, but in that from Bethany they are sometimes normally distributed, and sometimes entirely wanting over considerable areas. In spite of such analogy, however, the Bethany iron has a structure peculiar to itself, and Professor Berwerth informs me that even in the almost exhaustive collection of the Vienna Museum there is not one iron that can be directly compared with it.

The slices examined show few accessory constituents, and those found are of small size. I have observed only fifteen troilite inclusions, all of elongated shape, and with boundaries which are rather irregular, and occasionally finely zigzag. Their length varies from 4 to 8 mm., and their breadth from 1 to 1·5 mm.

Usually they are surrounded by a zone of kamacite, but in some instances the lamellæ are directly in contact with the troilite, a condition which is rather rare.

The dark spots on the right in Fig. 2, Plate VIII., are troilite.

In three places at least I noticed the presence of platy inclusions, 0·1 mm. wide, which have a bluish-black colour and a strong metallic lustre by reflected light. There is no doubt that these are daubréelite. The plates have irregular boundaries, and are orientated obliquely to the longest diameter of the troilite. Schreibersite occurs as tiny spangles or little zigzag rods, lying as a rule wedged in between the bars, and in one place it forms a plate-like piece, 7 mm. long. This is perhaps one of the so-called Reichenbach lamellæ; that is to say, it lies possibly parallel to a cube face.

The small amount of phosphorus in both analyses made, 0·06 per cent., shows that the schreibersite is really only sparingly present, not that it is merely very indistinct. The accessory constituents are found only in the portions showing numerous lamellæ. They are the first to crystallise out, and are followed by the lamellæ, which group themselves around them. The plessite forms last, and it therefore appears to me that the absence of troilite and schreibersite in those portions that are not lamellar, indicates that they are composed of plessite.

In order to ascertain if the small glistening scales which lie in these non-lamellar portions are to be regarded as taenite, I had two analyses made by Dr. Fahrenhorst.

Table I. gives the composition of one piece, which showed the structure characteristic of a finely lamellar octahedral iron; Table II. that of a piece without lamellæ. As these showed no essential differences, the sparingly occurring accessory constituents were determined only once. Neither piece left any residue in *aqua regia*.

	I.*a*	I.*b*	I.*c*	I.*d*	I.*e*	I.	II.
Amount in grams of material used	0·6949	6·6202	6·2474	2·6854	6·4652	...	0·6949
Fe	91·07	...	...	...	...	91·07	92·29
Ni	8.18	...	...	...	...	8·18	7·77
Co	0·63	...	...	...	...	0·63	0·57
Cu	...	0·028	...	...	...	0·03	
C	...	...	0·010	...	...	0·01	
Cr	...	...	...	0·018	...	0·02	0·10
Cl	...	...	...	...	0·004	trace	
S	...	...	...	0·036	...	0·04	
P	0·06	...	...	...	...	0·06	0·06
						100·04	100·79

From this we obtain as percentage composition of the nickel-iron :—

	I.		II.
Fe	91·22		91·75
Ni	8·12		7·65
Co	0·62		0·56
Cu	0·03		0·03
C	0·01		0·01
	100·00		100·00

From the amount of nickel and cobalt in the second analysis it follows that the fine scales in the non-lamellar portions are to be regarded as taenite—that is to say, an alloy rich in nickel. Comparison of the analyses shows that the proportion of this substance present, is in keeping with the appearance of the whole, it being somewhat greater in the parts showing a normal structure than it is elsewhere.

Finally, if one calculates from Table I. the mineralogical composition of the piece analysed, the following result is obtained :—

Nickel-iron	99·51
Schreibersite	0·39
Daubréelite	0·05
Troilite	0·04
Lawrencite	0·01
	100·00

I have here, as formerly, calculated the whole of the chromium obtained in solution as belonging to the daubréelite. Since, however, recent analyses of the Cape of Good Hope and Babbs Mill irons give less sulphur than the formula of daubréelite requires, the correctness of this mode of calculation appears questionable, especially as daubréelite is almost always observed as subsidiary inclusions in troilite, and the latter must always be present in much greater amount than the former. It is possible that the chromium occurs either in another compound also soluble in *aqua regia*, or that it is alloyed to some extent with the nickel-iron. At the same time the small amount present makes it of little consequence where one includes it.

Dr. W. Leick determined the specific gravity from a piece weighing 82·123 grams as 7·8408 at 18·5° C. From this the specific gravity of the nickel-iron would be 7·8502.

The chemical composition and specific gravity of this Bethany iron agree well, therefore, with those of other finely lamellar octahedral irons.*

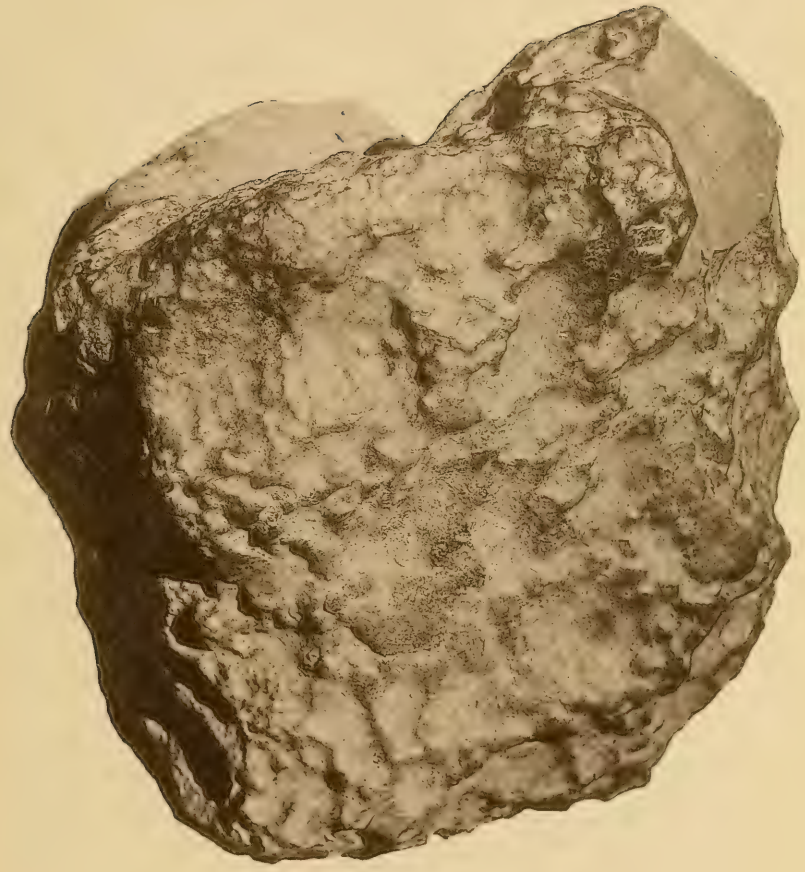
* Compare E. Cohen, Meteoreisen-Studien IV. u. V. Ann. des k.k. naturhist. Hofmuseums, 1895, x. 90–91, und 1897, xii. 44–45.

EXPLANATION OF PLATES.

PLATES VI. and VII.—Two views of the Bethany iron from opposite sides. The smooth surface in Plate VI. is where the *Challenger* people removed the piece in London. The piece now cut off was taken parallel to this surface. (See p. 24.)

PLATE VIII., Figs. 1 and 2.—Polished and etched surfaces of the iron. (See pp. 24–27.)

PLATE IX., Figs. 1 and 2.—Enlarged views of parts of the polished and etched surfaces. (See pp. 25–26.)



Bethany (Great Namaland) Meteorite.

$^{9}/_{32}$ *nat. size.*

Bethany (Great Namaland) Meteorite.

$^{9}/_{32}$ *nat. size.*

Fig. 1.

Fig. 2.

Bethany (Great Namaland) Meteorite.

Fig. 1 nat. size; Fig. 2 5/4 nat. size.

Fig. 1.

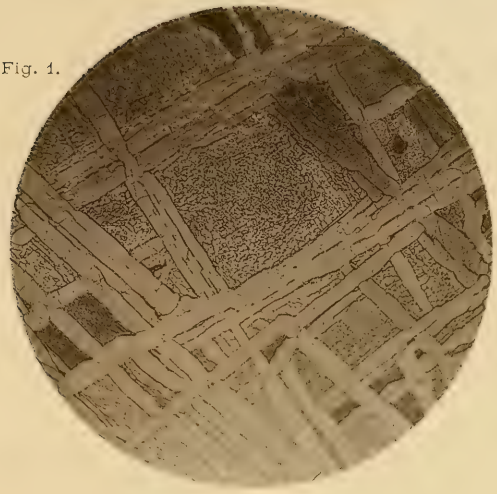
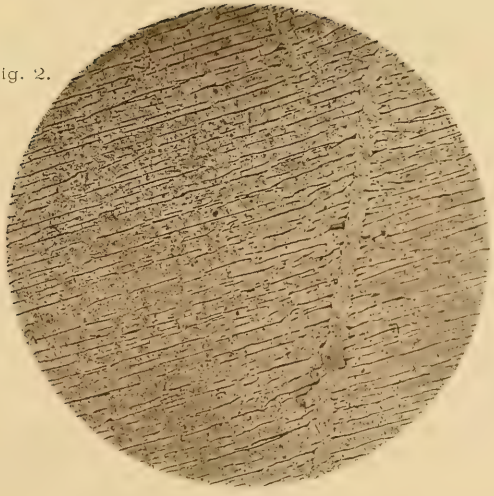


Fig. 2.



Bethany (Great Namaland) Meteorite.
$6^1/_2$ *nat. size.*

IV.—*The Moths of South Africa* (Part I.)—By Sir G. F. Hampson, Bart., B.A., F.Z.S., &c.

South Africa is the oldest British possession of any considerable size of which no list of the Moths, or *Lepidoptera Phalænæ*, has ever been published, and as there are now a considerable number of collectors in various parts of the territories, and a large number of species have accumulated in collections, I think it is time that something was done to increase the literature so as to bring our knowledge of the subject to nearer the level of that of the Butterflies, as given in Mr. Roland Trimen's most excellent work, and the many other papers written on them. Beyond a few scattered descriptions and figures almost our only sources of information are the figures in Felder's Reise Novaræ, the descriptions in Zeller's *Microlepidoptera Caffrarum*, and Wallengren's and Aurivillius' papers, so that the subject may fairly be said to be almost a virgin one.

The geographical limits I propose to assign to South Africa for the present purpose are on the north the Zambesi and the southern boundary of Angola. On the west this will form a natural division, being approximately the limits of the arid and humid zones, but on the east the Zambesi forms no zoological boundary, and the fauna is continuous with that of East Africa, extending on the west to the great Lakes and the Great Rift Valley, and on the north again continuous with the fauna of Arabia, Persia, and North-West India.

The three families dealt with in this first paper are the *Syntomidæ*, *Arctiadæ*, and *Agaristidæ*, forming the upper part of the great branch of the *Phalænæ*, with vein 5 of the forewing approximated to the lower angle of the cell, in the *Syntomidæ* vein 8 of the hindwing being absent, in the *Arctiadæ* coincident with the cell to near or to beyond middle, and in the *Agaristidæ* arising free then anastomosing

shortly with the cell, this last family being only distinguishable from the first sub-family of *Noctuidæ* by the antennæ being dilated towards extremity in correlation with day-flying habits.

The principal collectors of moths in South Africa whose material will form the basis of these papers have been—in Mashonaland, Mr. Guy A. K. Marshall, who has sent several very fine collections to the British Museum; in Matabeleland, Mr. F. Oates, whose collection, described in his volume, is now in the Oxford Museum; in the N'Gamiland country, Dr. Anderson and Colonel F. D. Lugard; in the Transvaal, Mr. W. L. Distant, whose collection has been described by himself in his 'Naturalist in the Transvaal' and various papers, and will be more thoroughly worked out in a volume now in hand, who has kindly lent me any specimens I required for examination; at Delagoa Bay, Mrs. Monteiro; in Natal, at Karkloof, Mr. G. A. K. Marshall; at Ladysmith, Colonel G. Fawcett, 5th Lancers; at Estcourt, Mr. J. M. Hutchinson; in the coast belt near Durban, Mr. D. Gooch, Colonel Bowker, Mr. C. W. Barker, whose collection, recently presented to the Oxford Museum, has been lent me by Professor Poulton, and Herr Gueinzius, of Leipsic; in the interior of Cape Colony, Dr., afterwards Sir C. Smith; in the Transkei and Eastern district, Miss F. Barrett, whose brother, Mr. G. C. Barrett, has most kindly given me anything required from the collections she has been sending him for many years; and at Knysna and Cape Town, Mr. Roland Trimen, F.R.S., till lately Director of the South African Museum, from whose collections came the species figured by Felder in the Reise Novaræ, which are now in the collection of the Hon. Walter Rothschild; whilst Mr. W. L. Sclater, the present Director of the Museum, has most kindly submitted to me all the material at his disposal, and Professor Aurivillius, of Stockholm, has been good enough to send me for examination many of the types of species described by Wallengren from South Africa.

Further collections from all parts of the country are, however, much wanted, and if sent to me at the British Museum (Natural History), with a number on each species, a list of identifications would be sent in return.

The only references given are the original reference, those that refer to forms described from South Africa and to a good figure of the insect.

As coloured figures of all the species in this paper which have not been figured before are given in the first three volumes of the Cat. Lep. Phal. B.M., no plates are necessary to illustrate this paper,

but it is hoped that in succeeding papers coloured figures of many species will be given. A (*) before the name of a species indicates that the species is not in the British Museum.

Family SYNTOMIDÆ.

Key to the Genera.

A. Hindwing with veins 6, 7 coincident.
  a. Hindwing with vein 4 absent.
    a^1. Hindwing with vein 3 absent.
      a^2. Thorax clothed with long hair below .. .. .. *Eutomis.*
      b^2. Thorax smoothly scaled below .. .. *Ceryx.*
    b^1. Hindwing with vein 3 present.
      a^2. Hindwing with vein 5 from lower angle of cell or stalked with 3.
        a^3. Forewing with vein 9 absent.
          a^4. Forewing with veins 4, 5 stalked .. .. *Pseudonaclia*
          b^4. Forewing with veins 4, 5 from cell .. .. *Psichotoë.*
        b^3. Forewing with vein 9 present.
          a^4. Forewing with vein 3 from close to angle of cell; 4, 5 stalked .. .. *Trichæta.*
          b^4. Forewing with vein 3 from well before angle of cell; 4, 5 usually from cell.
            a^5. Forewing with vein 11 stalked with 7, 8, 9, 10 .. .. *Syntomis.*
            b^5. Forewing with vein 11 from the cell .. *Epitoxis.*
      b^2. Hindwing with vein 5 from well above angle of cell *Apisa.*
  b. Hindwing with vein 4 present.
    a^1. Head, thorax, and abdomen smoothly scaled .. .. *Thyretes.*
    b^1. Head, thorax, and abdomen clothed with rough hair .. *Metarctia.*

B. Hindwing with veins 6, 7 not coincident .. .. *Euchromia.*

Genus PSICHOTOË.

Type.

Psichotoë, Boisd. Mon. Zyg. p. 129 (1829) ... *duvauceli.*

(1)*Psichotoë gnatula, Boisd. Voy. Delegorgue, ii. p. 596 (1847).
Cacosoma naclioides, Feld. Reis. Nov. pl. 102, f. 13 (1874).
Hab. **Transvaal**; **Natal**, Malvern; **Cape Colony**. *Exp.* 16 mill.

Genus EUTOMIS.

Type.

Eutomis, Hübn. Verz. p. 122 (1827) ... ... *minceus.*

(1) Eutomis minceus, Stoll. Pap. Exot. iv. pl. 347, A (1782).
Hab. **Cape Colony** (Trimen). *Exp.* 42 mill.

Genus CERYX.

Type.

Ceryx, Wllgrn. Wien. Ent. Mon. vii. p. 140 (1863) ... ... *anthraciformis.*

Sect. I. Antennæ dilated from middle to near extremity.

(1)*Ceryx anthraciformis, Wllgrn. Wien. Ent. Mon. iv. p. 40 (1860).
Naclia fuscicornis, Wllgrn. Wien. Ent. Mon. iv. p. 40 (1860).
,, *pygmula*, Oberth. Et. Ent. iii. p. 33, pl. 3, f. 6 (1878).
Hab. **Cape Colony.** *Exp.* 24 mill.

Sect. II. Antennæ not dilated.

A. Abdomen with yellow bands on fourth, fifth, and sixth segments *resecta.*
B. Abdomen with white basal and subterminal bands .. .. .. *toxotes.*
C. Abdomen with dorsal white spot at base .. .. *longipes.*

(2)*Ceryx resecta, Herr Schäff. Aussereur. Schmett. f. 269 (1855).
Hab. **S. Africa.** *Exp.* 34 mill.

(3) Ceryx toxotes, Hmpsn. Cat. Lep. Phal. B.M. i. p. 45, pl. 1, f. 19 (1898).
Hab. **Cape Colony**, Annshaw (Miss F. Barrett). *Exp.* 26 mill.

(4) Ceryx longipes, Herr Schäff. Aussereur. Schmett. f. 273 (1855).
Syntomis caryocatactes, Wllgrn. Wien. Ent. Mon. iv. p. 39 (1860).
Hab. **Natal**, Karkloof (Marshall). *Exp.* 30 mill.

Genus TRICHÆTA.

Type.

Trichæta, Swinh. Cat. Het. Mus. Oxon, p. 52 (1892) ... ... *teneiformis.*

Sect. I. Hindwing with veins 3, 5 on a long stalk, forewing of male with a fold above vein 5, the termen deeply indented at its extremity.

(1) Trichæta pterophorina, Mab. Bull. Soc. Ent. Fr. 1892, p. 139. id. Nov. Lep. pl. 21, f. 7.
Hab. **Mashonaland,** Salisbury (Marshall); **Natal** (Spiller). *Exp.* 20 mill.

Sect. II. Hindwing with veins 3, 5 from cell or shortly stalked; forewing of male normal.

(2) Trichæta fulvescens, Wlk. i. 132 (1854), Butl. Ill. Het. B.M. i. p. 17, pl. 7, f. 2.

Thyretes caffraria, Herr Schäff. Aussereur. Schmett. i. f. 271 (1855).

Naclia thyretiformis, Wllgrn. Wien. Ent. Mon. iv. p. 40 (1860).

Syntomis molanna, Wllgrn. öfv. Vet. Akad. Förh. xxxii. (1) p. 94 (1876).

Hab. **Congo**; **Natal** (Gooch, Hutchinson); **Cape Colony** (Smith). *Exp.* 24–26 mill.

Genus SYNTOMIS.

Type.

Syntomis, Ochs. Eur. Schmett. ii. p. 103 (1808) *phegea.*

Sect. I. Antennæ of male serrate.

(1) Syntomis atricornis, Wllgrn. Wien. Ent. Mon. vii. p. 139 (1863). Hmpsn. Cat. Lep. Phal. B.M. i. p. 75, pl. 3, f. 2.

Syntomis sirius, Dist. A.M.N.H. (6) xx. p. 15 (1897).

Hab. **Mashonaland** (Marshall); **Transvaal** (Distant); **Cape Colony.** *Exp.* 22 mill.

Sect. II. Antennæ of male simple.

A. Abdomen with the markings scarlet.
  a. Abdomen with basal scarlet patch and lateral series of three spots .. .. *kuhlweini.*
  b. Abdomen with basal scarlet patch and bands on third, fourth, and fifth segments .. .. *cerbera.*
B. Abdomen with three orange bands .. .. *johanna.*
C. Abdomen with lateral series of orange spots .. .. *simplex.*
D. Abdomen with white bands on first and fifth segments.. .. *rendalli.*

(2) Syntomis kuhlweini, Lef. Mag. Zool. Ins. pl. 23 (1831). Butl. Ill. Het. B.M. i. p. 16, pl. 6, f. 17.

Syntomis natalii, Boisd. Delegorgue Voy. Afr. Austr. ii. p. 596 (1847).

Hab. **Natal** (Trimen, Gueinzius); **Cape Colony.** *Exp.* 30–38 mill.

(3) Syntomis cerbera, Linn. Mus. Ulr. p. 363 (1764). Drury Ill. Ex. Ent. i. pl. 26, f. 2. Cram. Pap. Exot. i. pl. 83 F.

Syntomis fantasia, Butl. Journ. Linn. Soc. Zool. xii. p. 349 (1876).

Syntomis francisca, Butl. Journ. Linn. Soc. Zool. xii. p. 349 (1876).

Syntomis curtiplaga, Mab. Ann. Soc. Ent. Fr. (6) x. p. 35 (1890).
Hab. **West Africa**; **Delagoa Bay** (Monteiro); **Zululand**; **Natal** (Hutchinson); **Cape Colony.** *Exp.* ♂ 32, ♀ 38 mill.

(4) Syntomis johanna, Butl. Journ. Linn. Soc. Zool. xii. p. 348 (1876).
Syntomis anna, Butl. Journ. Linn. Soc. Zool. xii. p. 348 (1876).
Hab. **Cape Colony,** Knysna (Trimen). *Exp.* 32 mill.

(5) Syntomis simplex, Wlk. i. 129 (1854), Butl. Ill. Het. i. p. 15, pl. 6, f. 11.
Syntomis nostalis, Wlk. i. 129 (1854).
,, *corvus*, Wllgrn. Wien. Ent. Mon. iv. p. 39 (1860).
,, *monedula*, Wllgrn. Wien. Ent. Mon. iv. p. 39 (1860).
Hab. **Natal** (Gooch, Gueinzius). *Exp.* 30–34 mill.

(6)*Syntomis rendalli, Dist. A.M.N.H. (6) xx. p. 16 (1897), Hmpsn. Cat. Lep. Phal. B.M. i. p. 112, pl. 4, f. 23.
Hab. **Transvaal** (Distant). *Exp.* 20–22 mill.

Syntomis polydamon, Cram. Pap. Exot. iii. pl. 237 B (1780), was described from Cape Colony, but the figure almost agrees with a common Australian species, and nothing like it is known from South Africa.

Genus EPITOXIS.

	Type.
Epitoxis, Wllgrn. Wien. Ent. Mon. vii. p. 138 (1863)	*amazoula.*

Epitoxis amazoula, Boisd. Voy. Delegorgue, ii. p. 597 (1847), Herr Schäff. Aussereur. Schmett. f. 272.
Hab. **Natal,** D'Urban (Trimen), Newcastle, Estcourt (Hutchinson). *Exp.* 38 mill.

Genus PSEUDONACLIA.

	Type.
Pseudonaclia, Butl. Journ. Linn. Soc. Zool. xii. p. 351 (1865)	*puella.*

Pseudonactia puella, Boisd. Voy. Delegorgue, ii. p. 596 (1847).
Hab. **Delagoa Bay** (Mrs. Monteiro); **Mashonaland,** Salisbury (Marshall); **Natal** (Gooch). *Exp.* ♂ 22, ♀ 30 mill.

Genus THYRETES.

Type.

Thyretes, Boisd. Voy. Delegorgue, ii. p. 596 (1847) ... ... *hippotes.*

Sect. I. Build stout; frons with large tuft of hair; femora and tibiæ fringed with long hair.

A. Wings with the markings hyaline .. .. *hippotes.*
B. Wings with the markings yellow .. .. *montana.*

(1) Thyretes hippotes, Cram. Pap. Exot. iii. p. 286 A (1780).
Hab. **Cape Colony** (Trimen). *Exp.* ♂ 36, ♀ 50 mill.

(2)*Thyretes montana, Boisd. Voy. Delegorgue, ii. p. 597 (1847).
Hab. **Zululand; Cape Colony.** *Exp.* 34 mill.

Sect. II. Build slender; frons nearly smooth; femora and tibiæ slightly fringed with hair.

(3) Thyretes caffra, Wllgrn. Wien. Ent. Mon. vii. p. 138 (1863).
Hab. **Delagoa Bay** (Junot); **Cape Colony** (Drège). *Exp.* ♂ 38, ♀ 42 mill.

Genus APISA.

Type.

Apisa, Wlk. iv. 916 (1855) ... ... *canescens.*

Apisa canescens, Wlk. iv. 917 (1855).
Psychotöe pallota, Plotz. Stett. Ent. Zeit. xli. p. 78 (1880).
Apisa cinereo-costata, Holland, Psyche, vi. p. 394 (1893).
,, *cana*, Holland, Psyche, vi. p. 394 (1893).
Hab. **East** and **West Africa**; **Natal** (Gueinzius, Hutchinson).
Exp. ♂ 32–42, ♀ 38–64 mill.

Genus METARCTIA.

Type.

Metarctia, Wlk. iii. 769 (1855) ... ... *rufescens.*

A. Colour orange-red .. .. *lateritia.*
B. Colour pale reddish and fuscous .. .. *rufescens.*
C. Colour fulvous and fuscous.
a. Wings fulvous yellow, the interspaces of forewing and costal area of hindwing fuscous; head and abdomen mostly crimson .. .. *flavivena.*
b. Wings fuscous; forewing with a costal fascia and the cilia fulvous .. .. *meteus.*
c. Wings fulvous yellow, slightly tinged with fuscous, the veins fuscous.. .. .. *crassa.*

(1) Metarctia lateritia, Herr Schäff. Aussereur. Schmett. f. 274 (1855)

Anace rubra, Wlk. vii. 1720 (1856).

Hebena venosa, Wlk. vii. 1723 (1856).

Hexaneura cinnamomea, Wllgrn. Wien. Ent. Mon. iv. p. 164 (1860).

Automolis unicolor, Oberth. Ann. Mus. Genova xv. p. 186 (1880).

Automolis helleni, Snell. Notes, Leyd. Mus. viii. p. 1 (1886), id. Tijd. v. Ent. xxix. p. 224, pl. 8, f. 1.

Hab. **Galla Country**; **Nyasaland**; **Natal** (Gooch, Gueinzius, Marshall); **Bechuanaland** (Sir C. Metcalf); **Cape Colony**. *Exp.* 44–60 mill.

(2) Metarctia rufescens, Wlk. iii. 769 (1855), Hmpsn. Cat. Lep. Phal. B.M. i. p. 148, pl. 5, f. 6.

Hexaneura maculifera, Wllgrn. Wien. Ent. Mon. iv. p. 164 (1860).

Metarctia paremphares, Holland, Psyche, vi. p. 395 (1893).

Hab. **West Africa**; **Natal** (Gueinzius); **Cape Colony** (Trimen). *Exp.* 34–42 mill.

(3) Metarctia flavivena, n. sp.

♂. Head, thorax, and abdomen crimson; antennæ, tegulæ except edges, patagia, stripes on thorax, and the greater part of legs black; abdomen with slight segmental black lines, one on terminal segment more prominent, the ventral surface yellow with black bands. Forewing fuscous-black, the veins costa, inner margin and cilia yellow. Hindwing yellow with fuscous fascia on costal area; some crimson hair at base of inner margin.

♀. Abdomen with the black bands rather more prominent; hindwing with the interspaces of costal half suffused with black.

Hab. **British East Africa**, Machakos (Crawshay); **Mashonaland**, Salisbury (Marshall). *Exp.* ♂ 42, ♀ 46 mill.

(4) Metarctia meteus, Stoll. Pap. Exot. iv. p. 347 B (1782).

Decimia bicolora, Wlk. vii. 1718 (1856).

Hab. **Natal**, Karkloof (Marshall); **Cape Colony** (Dr. Smith), Knysna (Trimen). *Exp.* 44 mill.

(5) Metarctia crassa, Feld. Reis. Nov. pl. 99, f. 16 (1874).

Hab. **Cape Colony** (Drège). *Exp.* 42 mill.

Genus EUCHROMIA.

Type.

Euchromia, Hübn. Verz. p. 121 (1827) ... ... *sperchia.*

A. Tegulæ and patagia dark red .. .. *amœna.*
B. Tegulæ black and blue .. .. *formosa.*

(1) Euchromia amœna, Möschl. Stett. Ent. Zeit. xxxiii. p. 350 (1872), Hmpsn. Cat. Lep. Phal. B.M. p. 295, pl. 11, f. 2.
Euchromia africana, Butl. Journ. Linn. Soc. Zool. xii. p. 364 (1876).
Hab. **British East Africa**; **Delagoa Bay** (Monteiro); **Zululand**; **Natal**. *Exp.* 46–54 mill.

(2) Euchromia formosa, Guér. Icon. R. Anim. Ins. p. 501, pl. 84 bro., f. 10 (1829), Boisd. Fauna Madag. p. 82, pl. 11, f. 3.
Glaucopis folletii, Gray, Griff. Anim. Kingd. xv. pl. 120, f. 10 (1833).
Hab. **British East Africa**; **Madagascar**; **Natal** (Burrows, Marshall); **Cape Colony** (Trimen). *Exp.* 54–58 mill.

Family ARCTIADÆ.

Key to the Sub-Families.

A. Ocelli absent.
a. Forewing with raised tufts of scales .. .. *Nolinæ.*
b. Forewing without raised tufts of scales .. .. *Lithosianæ.*
B. Ocelli present .. .. *Arctianæ.*

Sub-Family NOLINÆ.

Key to the Genera.

A. Forewing with veins 9, 10 absent .. .. *Celama.*
B. Forewing with vein 9 absent, 10 stalked with 7, 8 .. .. *Nola.*

Genus CELAMA.

Type.

Celama, Wlk. xxxii. 500 (1864) ... ... *bifascialis.*
Aradrapha, Wlk. xxxiv. 1182 (1865) ... ... *tineoides.*
Epizeuctis, Meyr. Trans. Ent. Soc. 1889, p. 463 ... ... *innocua.*

Sect. I. (*Epizeuctis*). Hindwing of male with patch of rough scales on underside at tornus.

(1) Celama internella, Wlk. xxxi. p. 245 (1864).
Ræselia pascua, Swinh. P.Z.S. 1883, p. 293, pl. 20, f. 6.
Hab. **Natal** (Burrows); **Formosa**; **India**; **Ceylon**; **Borneo**; **New Guinea**; **New South Wales.** *Exp.* 16–18 mill.

Sect. II. (*Aradrapha*). Hindwing of male without patch of rough scales on underside at tornus.

A. Forewing with the postmedial line strongly excurved from below costa to vein 3 .. .. *meridionalis.*
B. Forewing with the postmedial line oblique .. .. *tineoides.*

(2) Celama meridionalis, Wllgrn. Œfv. Vet. Akad. Förh. xxxii. (1), p. 99 (1879).
Hab. **Transvaal** (Distant). *Exp.* 20 mill.

(3) Celama tineoides, Wlk. xii. 824 (1857).
Aradrapha partitalis, Wlk. xxxiv. 1182 (1865).
Nola caffra, Wllgrn. Œfv. Vet. Akad. Förh. xxxii. (1) p. 100 (1876).
Hab. **Transvaal**; **Natal** (Gueinzius); **Cape Colony** (Miss F. Barrett). *Exp.* 16 mill.

Genus NOLA.

Type.

Nola, Leach, Edinb. Encycl. ix. p. 135 (1815) ... ... *cucullatella.*

(1) Nola præfica, Saalm. Lep. Madag. i. p. 174, pl. 5, f. 57 (1884).
Hab. **Madagascar**; **Natal**, Karkloof (Marshall); **Cape Colony**, Transkei (Miss F. Barrett). *Exp.* 24 mill.

Sub-Family LITHOSIANÆ.

Key to the Genera.

A. Forewing with vein 5 absent.
a. Forewing with vein 4 absent.
a^1. Hindwing with veins 3, 4 coincident .. .. *Lepista.*
b^1. Hindwing with veins 3, 4 stalked.
a^2. Forewing with vein 2 from near angle of cell.. .. *Sozusa.*
b^2. Forewing with vein 2 from middle of cell, curved at base .. .. *Macrosia.*

b. Forewing with vein 4 present.
*a*¹. Forewing with vein 7 from 8 beyond 9.
*a*². Forewing with vein 2 curved at base .. .. .. *Lexis.*
*b*². Forewing with vein 2 oblique .. .. *Pusiola.*
*b*¹. Forewing with vein 7 from 8 before 9.
*a*². Forewing with vein 9 absent .. .. *Ctenosia.*
*b*². Forewing with vein 9 present.
*a*³. Forewing with vein 2 from towards end of cell, oblique.
*a*⁴. Hindwing with vein 6 stalked with 7 .. .. *Phryganopsis.*
*b*⁴. Hindwing with vein 6 from the cell .. .. *Hypagoptera.*
*b*³. Forewing with vein 2 from middle of cell, curved at base .. .. *Ilema.*

B Forewing with vein 5 present.
Hindwing with vein 5 absent, coincident with 4.
*a*¹. Forewing with vein 9 stalked with 7, 8 .. .. *Pasteosia.*
*b*¹. Forewing with vein 9 from 10 anastomosing with 8 to form the areole.
*a*². Forewing with vein 5 stalked with 4.
*a*³. Forewing with vein 3 stalked with 4, 5 .. .. *Lamprosia.*
*b*³. Forewing with vein 3 from the cell .. .. .. *Lysceia.*
*b*². Forewing with vein 5 from the cell .. .. *Carcinopodia.*
*c*¹. Forewing with veins 6, 7, and 8, 9 stalked .. .. .. *Eugoa.*
b Hindwing with vein 5 present.
*a*¹. Forewing with vein 9 stalked with 7, 8 or absent.
*a*². Forewing with vein 7 from 8 after 9.
*a*³. Proboscis aborted; foreleg with tibial claws .. *Aglossosia.*
*b*³. Proboscis present; foreleg without tibial claws.
*a*⁴. Hindwing with vein 5 obsolescent from just below angle of discocellulars.. .. .. .. *Chionæma.*
*b*⁴. Hindwing with vein 5 fully developed from well below angle of discocellulars.
*a*⁵. Palpi upturned .. .. *Siccia.*
*b*⁵. Palpi porrect .. .. *Eurosia.*
*b*². Forewing with vein 7 from 8 before 9, or 9 absent.
*a*³. Hindwing with veins 3, 4 stalked or coincident *Xanthetis.*
*b*³. Hindwing with vein 3 from or from close to angle of cell.
*a*⁴. Forewing with vein 11 anastomosing with 12 *Asura.*
*b*⁴. Forewing with vein 11 free .. .. *Miltochrista.*
*c*³. Hindwing with vein 3 from well before angle of cell .. .. *Paurophleps.*
¹. Forewing with veins 7, 8, and 9, 10 stalked .. .. .. *Philenora.*
¹. Forewing with vein 9 from 10 anastomosing with 8 to form the areole.
*a*². Hindwing with veins 3, 4 stalked .. .. *Caripodia.*
*b*². Hindwing with veins 3, 4 from cell .. .. *Diplonyx.*

Genus LEPISTA.

Type.

Lepista, Wllgrn. Wien. Ent. Mon. vii. p. 146 (1863) ... ... *pandula.*
Dyphlebia, Feld. Reis. Nov. p. 4 (1874) ... *pandula.*

A. Forewing orange with terminal black band .. .. *pandula.*
B. Forewing leaden grey with orange costal fascia .. .. .. *semiochracea.*

1) Lepista pandula, Boisd. Delagorgue, Voy. Afr. Austr. ii. p. 597 (1847).
Dyphlebia trimenii, Feld. Reis. Nov. pl. 106, f. 32.
,, *limbata*, Butl. P.Z.S. 1888, p. 98.
Hab. **East Africa**; **British Central Africa**; **Delagoa Bay** (Mrs. Monteiro); **Natal**, Karkloof, Malvern (Marshall); **Cape Colony.** *Exp.* 26 mill.

(2) Lepista semiochracea, Feld. Reis. Nov. pl. 106, f. 31 (1874).
Hab. **Natal**, Karkloof (Marshall); **Cape Colony.** *Exp.* 22 mill.

Genus LEXIS.

Type.

Lexis, Wllgrn. Vet. Akad. Handl. (2) 5 (4) p. 41 (1865) ... ... *bipunctigera.*

Lexis bipunctigera, Wllgrn. Wien. Ent. Mon. iv. p. 45 (1860).
Setina quadrinotata, Wlk. xxxi. 237 (1864).
Hab. **British East Africa**; **Natal** (Gueinzius). *Exp.* 30 mill.

Genus PUSIOLA.

Type.

Pusiola, Wllgrn. Wien. Ent. Mon. vii. p. 146 (1863) ... ... *flavicosta.*

Pusiola flavicosta, Wllgrn. Wien. Ent. Mon. iv. p. 45 (1860).
Hab. **Cape Colony.** *Exp.* 20 mill.

Genus PHRYGANOPSIS.

Type.

Phryganopsis, Hmpsn. Cat. Lep. Phal. B.M. ii. p. 120 (1900) ... ... *asperatella.*

A. Forewing with postmedial black spot on costa .. .. .. *asperatella*
B. Forewing without costal spot .. .. *cinerella.*

(1) *Phryganopsis asperatella*, Wlk. xxxi. 231 (1864).
,, *sordida*, Feld. Reis. Nov. pl. 106, f. 30 (1874).
Hab. **River Niger**; **Cape Colony**, Fort Pitt (Dr. Smith), Annshaw (Miss F. Barrett). *Exp.* 24–36 mill.

(2) PHRYGANOPSIS CINERELLA, Wllgrn. Wien. Ent. Mon. iv. p. 45 (1860), Hmpsn. Cat. Lep. Phal. B.M. ii. p. 120, pl. 21, f. 11.
Pusiola zelleri, Wllgrn. Wien. Ent. Mon. vii. p. 147 (1863).
Hab. **River Niger**; **Mashonaland**, Salisbury (Marshall); **Delagoa Bay** (Mrs. Monteiro); **Natal** (Gueinzius); **Cape Colony**, Annshaw (Miss F. Barrett). *Exp.* 20 mill.

GENUS SOZUSA.

	Type.
Sozusa, Wllgrn. Wien. Ent. Mon. vii. p. 146 (1863)	*scutellata.*

SOZUSA SCUTELLATA, Wllgrn. Wien. Ent. Mon. iv. p. 45 (1860).
Lithosia dorsoglauca, Wlk. xxxi. 225 (1864).
,, *natalica*, Möschl. Stett. Ent. Zeit. xxxiii. p. 354 (1872).
Hab. **Natal**, Estcourt (Hutchinson). *Exp.* 32–36 mill.

GENUS MACROSIA.

	Type.
Macrosia, Hmpsn. Cat. Lep. Phal. B.M. ii. p. 129 (1900)	*fumeola.*

MACROSIA FUMEOLA, Wlk. ii. 508 (1854).
Hab. **Cape Colony**, Knysna (Trimen), Annshaw (Miss Barrett). *Exp.* 42 mill.

GENUS CTENOSIA.

	Type.
Ctenosia, Hmpsn. Cat. Lep. Phal. B.M. ii. p. 130 (1900)	*psectriphora.*

CTENOSIA PSECTRIPHORA, Dist. A.M.N.H. (7) iii. p. 462 (1899).
Hab. **Transvaal**, Pretoria (Distant). *Exp.* 36 mill.

GENUS ILEMA.

	Type.
Eilema, Hübn. Vuz. p. 165 (1827)... ...	*caniola.*
Manulea, Wllgrn. Wien. Ent. Mon. vii. p. 45 (1863)	*gracilipennis.*

Sect. I. Antennæ of male bipectinate, with short stiff branches.

(1) ILEMA BIFASCIATA, Hmpsn. Cat. Lep. Phal. B.M. ii. p. 131 (1900).
Hab. **Delagoa Bay** (H. Junod); **Transvaal**, Johannesburg (Ross); **Cape Colony**. *Exp.* 22 mill.

Sect. II. Antennæ of male serrate, with fascicles of long cilia and bristles.

(2) Ilema phæopera, Hmpsn. Cat. Lep. Phal. B.M. ii. p. 131 (1900).
Hab. **Cape Colony**, Annshaw (Miss F. Barrett). *Exp.* 30 mill.

Sect. III. Antennæ of males ciliated.

A. Forewing with postmedial black band angled beyond the cell *goniophora.*
B. Forewing with postmedial black spot on costa.. .. .. .. *tetrasticta.*
C. Forewing without postmedial black spot on costa.
a. Forewing with black band on terminal area .. .. .. *elegans.*
b. Forewing without terminal black band.
a^1. Forewing with yellow or orange costal fascia.
a^2. Hindwing orange with the costal half blackish .. *sarceola.*
b^2. Hindwing orange with black suffusion at base .. *arculifera.*
c^2. Hindwing without black suffusion on costal or basal areas.
a^3. Forewing dark grey .. .. *vicaria.*
b^3. Forewing very pale grey .. .. *gracillipennis.*
b^1. Forewing without costal fascia.
a^2. Wings ochreous.
a^3. Forewing with a dark discoidal point .. .. *discifera.*
b^3. Forewing without discoidal point .. .. .. *monochroma.*
b^2. Wings pure white .. .. *virgineola.*

(3) Ilema goniophora, Hmpsn. Cat. Lep. Phal. B.M. ii. p. 154, pl. 22, f. 4 (1900).
Hab. **Cape Colony,** Transkei (Miss F. Barrett). *Exp.* 32 mill.

(4) Ilema bipuncta, Hübn. Eur. Schmett. ff. 286, 287 (1818).
Lithosia colon, Möschl. Stett. Ent. Zeit. xxxii. p. 353 (1872).
Hab. **Spain**; **Natal,** Estcourt (Hutchinson); **Cape Colony,** Annshaw (Miss F. Barrett). *Exp.* 36 mill.

(5) Ilema elegans, Butl. Trans. Ent. Soc. 1877, p. 347, Hmpsn. Cat. Lep. Phal. B.M. ii. p. 158, pl. 22, f. 7.
Hab. **Abyssinia**; **Mashonaland,** Salisbury (Marshall). *Exp.* 26 mill.

(6) Ilema sarceola, Hmpsn. Cat. Lep. Phal. B.M. ii. p. 162, pl. 22, f. 23 (1900).
Hab. **Cape Colony** (Mathew). *Exp.* 36 mill.

(7) Ilema arculifera, Feld. Reis. Nov. pl. 106, f. 33 (1874).
Hab. **Natal,** Karkloof (Marshall); **Cape Colony,** Annshaw (Miss F. Barrett). *Exp.* 26 mill.

(8) Ilema vicaria, Wlk. ii. 505 (1854).
Hab. **Old Calabar**; **Congo**; **Natal,** Durban (Bowker); **China**; **India**; **Ceylon**; **Borneo**; **Java**. *Exp.* 26–34 mill.

(9) Ilema gracillipennis, Wllgrn. Wien. Ent. Mon. iv. p. 45 (1860) Hmpsn. Cat. Lep. Phal. B.M. ii. p. 166, pl. 22, f. 20.
Manulea planissima, Wllgrn. Œfv. Vet. Akad. Förh. xxxii. (1) p. 100 (1876).
Hab. **Transvaal; Natal,** Estcourt (Hutchinson). *Exp.* 36 mill.

(10) Ilema discifera, Hmpsn. Cat. Lep. Phal. B.M. ii. p. 171 (1900).
Hab. **Natal,** Karkloof (Marshall). *Exp.* 30 mill.

(11) Ilema monochroma, Holl. Psyche, vi. p. 411 (1893), Hmpsn. Cat. Lep. Phal. B.M. ii. p. 171, pl. 23, f. 2.
Hab. **Sierra Leone; Ogové River; Cape Colony,** Annshaw (Miss F. Barrett). *Exp.* 20 mill.

(12) Ilema virgineola, Hmpsn. Cat. Lep. Phal. B.M. ii. p. 178, pl. 23, f. 22 (1900).
Hab. **Cape Colony,** Capetown (Kirstenbosch). *Exp.* 38 mill.

Species Auctorum.

Lithosia heterocera, Wlk. xxxi. 226 (1864), type lost ... ... South Africa.
Lithosia desperata, Wlk. Trans. Ent. Soc. (3), i. p. 73 (1862), type lost ... ... Cape Colony.

Genus HYPAGOPTERA.

	Type.
Hypagoptera, Hmpsn. Cat. Lep. Phal. B.M. ii. p. 179 (1900)	*rufeola.*

Hypagoptera rufeola, Hmpsn. Cat. Lep. Phal. B.M. ii. p. 179 (1900).
Hab. **Natal,** Estcourt (Hutchinson). *Exp.* 32 mill.

Genus LAMPROSIA.

	Type.
Lamprosia, Hmpsn. Cat. Lep. Phal. B.M. ii. p. 217 (1900)	*eborella.*

Lamprosia eborella, Boisd. Delagorgue Voy. Afr. Austr. ii. p. 597 (1847).
Lamprosia pygmæa, Wlk. ii. 307 (1854).
Hab. **Cape Colony,** Fort Pitt (Dr. Smith), Annshaw (Miss F. Barrett). *Exp.* 30–36 mill.

Genus PASTEOSIA.

Type.

Pasteosia, Hmpsn. Cat. Lep. Phal. B.M. ii. p. 217 (1900) ... ... *irrorata.*

Sect. I. Forewing with veins 7, 8, 9 stalked; 10 free.

(1) Pasteosia irrorata, Hmpsn. Cat. Lep. Phal. B.M. ii. p. 218 (1900).

Hab. **Cape Colony**, Annshaw (Miss F. Barrett). *Exp.* 26 mill.

Sect. II. Forewing with vein 9 from 10 anastomosing with 8 to form the areole, 7 from beyond 9.

(2) Pasteosia plumbea, Hmpsn. Cat. Lep. Phal. B.M. ii. p. 218 (1900).

Hab. **Cape Colony**, Transkei (Miss F. Barrett). *Exp.* 32 mill.

Genus LYSCEIA.

Type.

Lysceia, Wlk. ii. 541 (1854) ... ... *bigutta.*

Lysceia bigutta, Wlk. ii. 541 (1854).

Hab. **Natal**, Karkloof (Marshall); **Cape Colony**, Fort Pitt (Dr. Smith). *Exp.* 24–26 mill.

Genus AGLOSSOSIA.

Type.

Aglossosia, Hmpsn. Cat. Lep. Phal. B.M. ii. p. 247 (1900) ... ... *flavimarginata.*

Aglossosia flavimarginata, Hmpsn. Cat. Lep. Phal. B.M. ii. p. 247 (1900).

Hab. **Natal**, Mooi River, Newcastle. *Exp.* 34 mill.

Genus CARIPODIA.

Caripodia, Hmpsn. Cat. Lep. Phal. B.M. ii. p. 248 (1900).

Caripodia chrysargyria, Hmpsn. Cat. Lep. Phal. B.M. ii. p. 248 (1900).

Hab. **Tanganika**; **Nyasa**; **Mashonaland**, Salisbury (Marshall). *Exp.* 24–36 mill.

Genus DIPLONYX.

Diplonyx, Hmpsn. Cat. Lep. Phal. B.M. ii. p. 249 (1900).

Diplonyx infumata, Hmpsn. Cat. Lep. Phal. B.M. ii. p. 249 (1900).

Hab. **Cape Colony**, Annshaw (Miss F. Barrett). *Exp.* 34 mill.

Genus CARCINOPODIA.

Type.

Carcinopodia, Hmpsn. Cat. Lep. Phal. B.M. ii. p. 249 (1900) ... ... *furcifasciata.*

Carcinopodia argentata, Distant, A.M.N.H. (6) xx. p. 199 (1897), Hmpsn. Cat. Lep. Phal. B.M. ii. p. 250, pl. 25, f. 18.

Hab. **Transvaal**, Pretoria (Distant). *Exp.* 42 mill.

Genus CHIONÆMA.

Type.

Chionæma, Herr Schäff. Aussereur. Schmett. p. 20 (1850) ... ... *puella.*

A. Forewing with scarlet lines .. .. *pretoriæ.*
B. Forewing with blackish lines .. .. *marshalli.*
C. Forewing without lines .. .. *rejecta.*

(1) Chionæma pretoriæ, Distant, A.M.N.H. (6) xx. p. 198 (1897), Hmpsn. Cat. Lep. Phal. B.M. ii. p. 324, pl. 27, f. 24.

Hab. **Transvaal** (Distant); **Natal**, Estcourt (Hutchinson). *Exp.* 34 mill.

(2) Chionæma marshalli, Hmpsn. Cat. Lep. Phal. B.M. ii. p. 325, pl. 27, f. 26 (1900).

Hab. **Natal**, Malvern (Marshall), Estcourt (Hutchinson). *Exp.* 26 mill.

(3) Chionæma rejecta, Wlk. ii. 521 (1854), Hmpsn. Cat. Lep. Phal. B.M. ii. p. 326, pl. 27, f. 22.

Hab. **Sierra Leone**; **Natal**, Karkloof (Marshall). *Exp.* 28 mill.

Genus EUROSIA.

Type.

Eurosia, Hmpsn. Cat. Lep. Phal. B.M. ii. p. 330 (1900) ... ... *trimaculata.*

Eurosia lineata, Hmpsn. Cat. Lep. Phal. B.M. ii. p. 331, pl. 27, f. 19 (1900).

Hab. **Cape Colony**, Transkei (Miss F. Barrett). *Exp.* ♀ 20 mill.

Genus SICCIA.

	Type.
Siccia, Wlk. ii. 539 (1854)	*caffra.*
Melania, Wllgrn. Wien. Ent. Mon. vii. p. 145 (1863)	*caffra.*

A. Forewing with the postmedial line very strongly angled inwards in submedian fold .. .. *caffra.*
B. Forewing with the postmedial line slightly angled inwards in submedian fold .. .. *punctipennis.*

(1) Siccia caffra, Wlk. ii. 539 (1854).
Lithosia nigropunctata, Wllgrn. Wien. Ent. Mon. iv. p. 46 (1860).
Melania punctigera, Feld. Reis. Nov. pl. 106, f. 34, 35 (1874).
Hab. **Natal**, Estcourt (Hutchinson); **Cape Colony**, Knysna (Trimen). *Exp.* 20–24 mill.

(2) Siccia punctipennis, Wllgrn. Wien. Ent. Mon. iv. p. 46 (1860).
Autoceras nigropunctana, Saalm. Lep. Madag. i. p. 169, pl. 7, f. 103 (1884).
Hab. **Madagascar; British East Africa; Cape Colony.** *Exp.* 18 mill.

Species Auctorum.

Lithosia pustulata, Wllgrn. Wien. Ent. Mon. iv. p. 46 (1860)	South Africa.

Genus XANTHETIS.

	Type.
Xanthetis, Hmpsn. Cat. Lep. Phal. B.M. ii. p. 414 (1900)	*naringa.*

Xanthetis ichorina, Butl. Trans. Ent. Soc. 1877, p. 345, Hmpsn. Cat. Lep. Phal. B.M. ii. p. 415, pl. 30, f. 10.
Hab. **Natal** (Gueinzius). *Exp.* 20 mill.

Genus ASURA.

	Type.
Asura, Wlk. ii. 484 (1854)	*cervicalis.*

A. Forewing with the postmedial line highly dentate .. .. .. *fulvia.*
B. Forewing with the postmedial line not dentate .. .. .. *sagenaria.*

(1) Asura fulvia, Hmpsn. Cat. Lep. Phal. B.M. ii. p. 439, pl. 30, f. 25 (1900).
Hab. **Natal**, Verulam (Spiller). *Exp.* 20 mill.

(2) Asura sagenaria, Wllgrn. Wien. Ent. Mon. iv. p. 46 (1860); Hmpsn. Cat. Lep. Phal. B.M. ii. p. 445, pl. 30, f. 17.
Barsine natalensis, Wlk. xxxi. 250 (1864).
Hab. **Delagoa Bay** (H. Jonod), **Natal** (Heale), Malvern (Marshall). *Exp.* ♂ 28, ♀ 34 mill.

Species Auctorum.

Setina atroradiata, Wlk. xxxi. 236 (1864) type lost ... ... S. Africa.

Genus MILTOCHRISTA.

Type.
Miltochrista, Hübn. Verz. p. 166 (1827)... ... *miniata*.

Miltochrista rivulosa, Wlk. ii. 540 (1854); Hmpsn. Cat. Lep. Phal. B.M. ii. p. 479, pel. 32, f. 4.
Hab. **Natal** (Gooch). *Exp.* 26 mill.

Genus PHILENORA.

Type.
Philenora. Rosenst. A.M.N.H. (5) xvi. p. 382 (1885) ... ... *undulosa*.
Scæodora, Meyr. P. Linn. Soc. N.S.W. (2) 1, p. 731 (1886) ... ... *omophanes*.
Ochrota, Kirby, Cat. Het. p. 352 (1893) ... *unicolor*.
Bettonia, Butl. P.Z.S. 1898, p. 418 ... ... *unicolor*.

Sect. I. Forewing long and narrow.

(1) Philenora bipuncta, Hmpsn. Cat. Lep. Phal. B.M. ii. p. 508, pl. 33, f. 21 (1900).
Hab. **Madagascar; Cape Colony,** Tolini (Miss F. Barrett). *Exp.* 20–24 mill.

Sect. II. Forewing short and broad.

(2) Philenora unicolor, Hopff. Monatsber. Akad. Berl. 1857, p. 432; Peter's Reise Moz. Ins. p. 427, pl. 28, f. 1 (1862).
Setina quadripunctata, Wlk. xxxi. 236 (1864).
Lithosia rubriceps, Rogenh. Ann. Nat. Hofmus. vi. p. 463, pl. 15, f. 11 (1891).
Bettonia ferruginea, Butl. P.Z.S. 1898, p. 418, pl. 32, f. 5.
Hab. **Somaliland; British East Africa; Mozambique; Mashonaland,** Salisbury (Marshall); **Natal,** Weenen; **Cape Colony,** Bedford (Mansell Weale); Annshaw (Miss F. Barrett). *Exp.* 20–24 mill.

Genus PAUROPHLEPS.

Type.

Plaurophleps, Hmpsn. Cat. Lep. Phal. B.M. ii. p. 531 (1900) ... ... *minuta.*

Paurophleps minuta, Hmpsn. Cat. Lep. Phal. B.M. ii. p. 531 (1900).

Hab. **Cape Colony,** Transkei (Miss F. Barrett). *Exp.* 14 mill.

Genus EUGOA.

Type.

Eugoa, Wlk. xii. 768 (1857) ... ... *æqualis.*

Eugoa africana, Hmpsn. Cat. Lep. Phal. B.M. ii. p. 545, pl. 34, f. 2 (1900).

Hab. **Cape Colony,** Grahamstown (Miss F. Barrett). *Exp.* 22 mill.

Sub-Family ARCTIANÆ.

Key to the Genera.

A. Forewing with vein 11 stalked with 10 .. .. *Ilemodes.*
B. Forewing with vein 11 from the cell.
  a. Forewing with vein 6 from or from close to upper angle of cell.
    a^1. Forewing with vein 10 stalked with 7, 8, 9.
      a^2. Fore tibiæ with curved claw at extremity.
        a^3. Hind tibiæ with the medial spurs absent .. .. *Amsacta.*
        b^3. Hind tibiæ with the medial spurs present.. .. *Estigmene.*
      b^2. Fore tibiæ without curved claw.
        a^3. Hind tibiæ with the medial spurs absent.
          a^4. Head and thorax clothed with rough hair .. *Mænas.*
          b^4. Head and thorax smoothly sealed .. .. *Creatonotus.*
        b^3. Hind tibiæ with the medial spurs present .. .. *Diacrisia.*
    b^1. Forewing with vein 10 from the cell .. .. *Dionychopus.*
    c^1. Forewing with vein 9 from 10 anastomosing with 8 to form the areole.
      a^2. Proboscis absent.
        a^3. Fore tibiæ with curved claw at extremity; hind tibiæ with the medial spurs absent .. .. .. *Teracotona.*
        b^3. Fore tibiæ without curved claw; hind tibiæ with the medial spurs present.
          a^4. Frons with prominence ending in a point and curved plate below .. .. *Procanthia.*
          b^4. Frons without prominence .. .. *Antarctia.*
      b^2. Proboscis present.
        a^3. Palpi upturned.
          a^4. Build stout .. .. *Rhodogastria.*
          b^4. Build slender . .. . *Utetheisa.*

b^3. Palpi porrect.
a^4. Palpi short; frons with rounded prominence *Grammarctia.*
b^4. Palpi long and downturned; frons without prominence .. .. *Secusio.*
b. Forewing with vein 6 from middle of discocellulars .. .. *Psycharium.*

Genus ILEMODES, nov.

Type *I. heterogyna.*

Proboscis fully developed; palpi porrect to just beyond frons; antennæ of male bipectinate, of female with bristles and cilia; tibiæ with the spurs moderate. Forewing rather long and narrow: vein 3 from close to angle of cell; 4, 5 from angle; 6 from upper angle; 7, 8, 9, 10 stalked; 11 free. Hindwing with vein 3 from angle of cell; 4, 5 stalked; 6, 7 stalked; 8 from before middle of cell.

Ilemodes heterogyna, n. sp.

♂. Head and thorax white, frons orange, palpi at tips and antennæ brown; fore tibiæ and tarsi brown above; pro- and meta-thorax with pairs of black spots; abdomen orange-yellow. Forewing ochreous, thickly irrorated with purplish brown; a black discoidal point; a white fascia on inner margin extending up to vein 1. Hindwing orange-yellow with black discoidal spot.

♀. Forewing silvery white with black discoidal points and black-brown fascia above vein 1.

Hab. **Natal** (Heale); **Cape Colony**, East London (Borchards). *Exp.* 40 mill.

Genus AMSACTA.

	Type.
Amsacta, Wlk. iv. 804 (1855)	*marginalis.*
Acantharctia, Auriv. Ent. Tidskr. 1899, p. 241	*nivea.*

A. Forewing with more or less developed streaks in submedian and discal folds .. .. *vittata.*
B. Forewing without black streaks .. .. *flavicosta.*

(1) Amsacta vittata, Auriv. Ent. Tidskr. 1899, p. 242.

Hab. **Bechuanaland**; **Natal**, Weenen. *Exp.* 40 mill.

(2) Amsacta flavicosta, n. sp.

♂. Head orange; palpi black above; antennæ with the branches black; thorax white, the tegulæ and patagia edged with yellow; tibiæ and tarsi fuscous above; abdomen orange with dorsal black bands and lateral series of points. Forewing white, the costal area and cilia orange. Hindwing white, the cilia orange at apex.

Hab. **Mashonaland**, Salisbury (Marshall). *Exp.* 38 mill.

Genus ESTIGMENE.

	Type.
Estigmene, Hübn. Verz. p. 184 (1827)	*acræa.*

A. Forewing bright lemon yellow.
  a^1. Forewing with black streaks on the veins .. .. .. *lemniscata.*
  b^1. Forewing without black streaks on the veins .. .. *dissimilis.*
B. Forewing bright ochreous yellow with fine black streaks on the veins .. .. *tenuistrigata.*
C. Forewing dull ochreous with somewhat diffused black streaks .. .. *linea.*
D. Forewing white with three straight black streaks .. .. *trivitta.*

(1) Estigmene lemniscata, Dist. A.M.N.H. (7) 1, p. 116 (1897).
Hab. **Transvaal,** Johannesburg (Cregoe). *Exp.* 34 mill.

(2) Estigmene dissimilis, Dist. A.M.N.H. (6) xx. p. 198 (1897).
Hab. **Transvaal,** Johannesburg (Cregoe). *Exp.* 40 mill.

(3) Estigmene tenuistrigata, n. sp.

♂. Head and thorax bright ochreous yellow; palpi above, antennæ, and tibiæ and tarsi above, black; abdomen orange with dorsal black bands and lateral series of black points, the ventral surface ochreous. Forewing bright ochreous yellow; the veins with fine black streaks except the costal and base of subcostal nervures. Hindwing ochreous yellow, the veins with very slight black streaks.
Hab. **Mashonaland,** Salisbury (Marshall). *Exp.* 46 mill.

(4) Estigmene linea, Wlk. iii. 671 (1855).
Spilosoma dorsalis, Wlk. iii. 671 (1855).
,, *truncatum*, Wlk. vii. 1781 (1856).
,, *strigatum*, Wllgrn. Wien. Ent. Mon. iv. p. 161 (1860).
Lacides lineata, Butl. Cist. Ent. ii. p. 27 (1875).
Hab. **Natal,** Karkloof (Marshall), Estcourt (Hutchinson); **Cape Colony** (Gueinzius, Smith), Transkei (Miss F. Barrett).
Exp. 44 mill.

(5) Estigmene trivitta, Wlk. iii. 673 (1855).
Hab. **Natal** (Gueinzius). *Exp.* ♂ 42, ♀ 46 mill.

Genus MÆNAS.

	Type.
Mænas, Hübn. Verz. p. 167 (1827)	*vocula.*
Eutænia, Wllgrn. Œfv. Svensk. Akad. Förh. xxxii. (1) p. 102 (1876)	*arborifera.*

A. Forewing with three patches on costa beyond middle .. .. *vocula.*
B. Forewing with fascia on costa beyond middle .. .. *arborifera.*

(1) Mænas vocula, Stoll. Suppl. Cram. pl. 31, f. 5 (1790).
Hab. **Cape Colony**, Knysna (Trimen). *Exp.* 36–40 mill.

(2) Mænas arborifera, Butl. Cist. Ent. ii. p. 26 (1875).

Eutænia scapulosa, Wllgrn. Œfv. Svensk. Akad. Förh. xxxii. (1) p. 102 (1876).
Calligula Wallengrenii, Auriv. Œfv. Svensk. Akad. Förh. xxxvi. (7) p. 56 (1879).
Lacides gracilis, Butl. P.Z.S. 1891, p. 417, pl. 32, f. 4.
Hab. **British East Africa, Angola**; **Delagoa Bay** (De Rougemont); **Transvaal**, Pochefstroom; **German South-West Africa**, Ovampo Lake (Ericsson). *Exp.* 38 mill.

Genus CREATONOTUS.

	Type.
Creatonotus, Hübn. Verz. p. 167 (1827) ...	*interruptus.*

Creatonotus punctivitta, Wlk. iii. 673 (1855).
Hab. **Natal** (Gueinzius). *Exp.* 42 mill.

Genus DIACRISIA.

	Type.
Diacrisia, Hübn. Verz. p. 169 (1827) ...	*sannio.*
Spilosoma, Steph. Ill. Brit. Ent. Haust. ii. p. 74 (1829)	*lubricipeda.*
Aloa, Wlk. iii. 699 (1855)	*lineata.*
Binna, Wlk. xxxi. 319 (1864)	*lutescens.*
Sænura, Wllgrn. Œfv. K. Akad. Förhandl. xv. p. 214 (1858)	*lineata.*
Eyralpenus, Butl. Cist. Ent. ii. p. 35 (1875)	*testaceus.*
Spilarctia, Butl. Cist. Ent. ii. p. 39 (1875)	*lubricipeda.*
Leucaloa, Butl. Cist. Ent. ii. p. 44 (1875)...	*eugraphica.*

A. Forewing pure white.
  a. Forewing with series of black spots.
    a^1. Forewing with the spots large; frenulum of male black *maculosa.*
    b^1. Forewing with the spots small; frenulum of male white *auricincta.*
  b. Forewing with fine black streaks on the veins .. .. *lineata.*
  c. Forewing with blackish fascia on terminal part of costa.. .. *scortilla.*
  d. Forewing uniform white .. .. *chionea.*
B. Forewing ochreous yellow.
  a. Forewing with waved ante- and post-medial black lines.. .. *eugraphica.*
  b. Forewing with antemedial, medial, and postmedial series of points on each side of the veins.
    a^1. Hindwing whitish .. .. *testacea.*
    b^1. Hindwing orange-yellow .. .. *diplosticta.*

c. Forewing with fuscous streaks in the interspaces.
  a^1. Hindwing black with yellow streaks on the veins .. .. *scita*.
  b^1. Hindwing yellow.
    a^2. Forewing with the fuscous streaks almost filling the interspaces .. .. *rhodesiana*.
    b^2. Forewing with the fuscous streaks narrow except in discal and submedian folds .. .. *lutescens*.
d. Forewing with discoidal spot only .. .. *lucida*.
e. Forewing immaculate .. .. *flava*.

(1) Diacrisia maculosa, Stoll. Pap. Exot. iv. pl. 370 B. (1781).
Ecpantheria assimilis, Hübn. Verz. p. 183 (1827).
,, *indeterminata*, Wlk. iii. 697 (1855).
Spilosoma punctulatum, Wllgrn. Wien. Ent. Mon. iv. p. 161 (1860).
Halesidota macularia, Wlk. xxxi. 314 (1864).
Hab. **Sierra Leone**; **British East Africa**, Machakos; **Mashonaland**, Salisbury (Marshall). *Exp.* ♂ 42, ♀ 50 mill.

(2) Diacrisia auricincta, Butl. P.Z.S. 1896, p. 847, pl. 42, f. 6.
Hab. **Nyasaland**; **Mashonaland**, Salisbury (Marshall). *Exp.* 48 mill.

(3) Diacrisia lineata, Wlk. iii. 672 (1855).
Aloa simplex, Wlk. iii. 699 (1855).
Sœnura alba, Wllgrn. Wien. Ent. Mon. iv. p. 162 (1860).
Spilarctia puella, Druce, A.M.N.H. (7) 1, p. 210 (1898).
Hab. **British East Africa**; **Lake N'gami** (Lugard); **Delagoa Bay** (Junod); **Natal** (Gueinzius, Gooch); **Cape Colony** (Trimen). *Exp.* 38–48 mill.

(4) Diacrisia scortilla, Wllgrn. Œfv. Vet. Akad. Förh. xxxii. (1) p. 101 (1876).
Aloa nigricosta, Holl. Psyche, vi. p. 398 (1893).
Hab. **West Africa**, Ogové River; **Transvaal**; **Natal**, Mooi River. *Exp.* 30–36 mill.

(5) Diacrisia chionea, n. sp.
♀. Head pale yellow; palpi above and antennæ black; thorax white, sides of pectus, fore coxæ and femora above pale yellow, the fore coxæ with brown patches, tibiæ and tarsi above black; abdomen orange with dorsal series of black spots, and lateral series of points, the ventral surface whitish. Forewing pure white. Hindwing orange-yellow.
Hab. **Natal**, Weenen. *Exp.* 44 mill.

(6 Diacrisia eugraphica, Wlk. xxxi. 292 (1864).
Aloa undistriga, Feld. Reis. Nov. pl. 100, f. 21 (1874).
Hab. **Natal,** Karkloof (Marshall). *Exp.* 50 mill.

(7) Diacrisia testacea, Wlk. iii. 670 (1855).
Spilosoma subflavescens, Wlk. xxxi. 293 (1864).
Hab. **Zululand; Natal** (Gueinzius, Gooch), Karkloof (Marshall). *Exp.* 40 mill.

(8) Diacrisia diplosticta, n. sp.
♂. Ochreous yellow; palpi above and antennæ black; patagia with black points; fore coxæ and femora, mid tibiæ and the tarsi black above, hind tibiæ with a spot on outer side and the spurs black; abdomen orange with dorsal series of short black bands and two lateral series of points. Forewing with antemedial series of three points angled on median nervure; a medial series of points acutely angled on median nervure, the spots towards costa and inner margin larger; two points just beyond discocellulars and three at lower angle of cell; a postmedial series consisting of pairs of points on each side of the veins, strongly excurved from costa to vein 4, then incurved. Hindwing orange-yellow with black discoidal spot.
Hab. **Natal,** Karkloof (Marshall). *Exp.* 42 mill.

(9) Diacrisia scita, Wlk. xxxi. 298 (1864).
Hab. **Natal,** Malvern (Marshall), Durban (Bowker). *Exp.* 44 mill.

(10) Diacrisia rhodesiana, n. sp.
♂. Head and thorax pale grey-brown; palpi above and branches of antennæ black, vertex of head, and edges of tegulæ, patagia, and thorax orange-red; pectus orange-yellow; forelegs and mid and hind tibiæ and tarsi above fuscous; abdomen orange with dorsal series of black bands and lateral series of points, the ventral surface greyish. Forewing yellow, the interspaces almost filled by pale grey-brown fasciæ leaving streaks on the veins and in cell and submedian fold yellow. Hindwing yellowish white.
♀ Rather darker; hindwing orange-yellow.
Hab. **Mashonaland,** Salisbury (Marshall). *Exp.* ♂ 46, ♀ 56 mill.

(11) Diacrisia lutescens, Wlk. iii. 672 (1855).
Binna penicillata, Wlk. xxxi. 319 (1864).
Spilosoma screabile, Wllgrn. Œfv. Vet. Akad. Förhandl. xxxii. (1) p. 102 (1876).
Hab. **Sierra Leone; Old Calabar; Mashonaland,** Salisbury (Marshall); **Transvaal; Natal,** Karkloof (Marshall), Durban (Bowker). *Exp.* ♂ 38–46, ♀ 58 mill.

(12) Diacrisia lucida, Druce, A.M.N.H. (7) 1, p. 212 (1898).
Hab. **East Africa,** Teita; **Mashonaland,** Salisbury (Marshall).
Exp. 34 mill.

13) Diacrisia flava, Wllgrn. Wien. Ent. Mon. iv. p. 162 (1860).
Hab. **Natal** (Heale). *Exp.* 42 mill.

Species Auctorum.

Estigmene strigosa, Möschl. Stett. Ent. Zeit. xxxiii. p. 355 (1872)... ... ... Natal.

Genus DIONYCHOPUS.

Type.

Dionychopus, Herr Schäff. Aussereur. Schmett. p. 14 (1850) ... ... *amasis*.

Dionychopus amasis, Cram. Pap. Exot. iii. pl. 206 D. (1780).
Noctua serici Thunb. Vet. Akad. N. Handl. ii. p. 242, pl. 5, ff. 1, 2 (1781).
Chelonia erythronota, Boisd. Delegorgue Voy. Afr. Austr. ii. p. 598 (1847).
Munychia callipyga, Wllgrn. Wien. Ent. Mon. iv. p. 162 (1860).
Dionychopus similis, Möschl. Verh. Zool. Bot. Ges. Wien. xxxiii. p. 288 (1884).
Aloa delineata, Wlk. iii. 700 (1855).
Aloa thunbergii, Guér. Rév. Zool. (2) xiv. p. 351 (1862).
Hab. **Transvaal** (Ross); **Natal**, Karkloof, Malvern (Marshall, Gueinzius, Gooch); **Cape Colony**, Transkei (Miss F. Barrett).
Exp. 66–74 mill.

Genus TERACOTONA.

Type.

Macronyx, Feld. Reis. Nov. p. 6 (1874), nec. Swains. Aves 1837 ... ... *submacula*.
Teracotona, Bull. P.Z.S. 1878, p. 382 ... *rhodophæa*.

A. Abdomen scarlet above, whitish below.
a. Forewing not clouded with fuscous .. .. *euprepia*.
b. Forewing clouded with fuscous .. .. *rhodophæa*.
B. Abdomen orange above and below, tinged with scarlet towards base .. .. *submacula*.

(1) Teracotona euprepia, n. sp.

♂. Head and thorax ochreous white; palpi crimson, black at tips; frons with crimson bar above; antennæ black, crimson

towards base; edges of tegulæ and patagia crimson; pectus and femora crimson; tibiæ black, fringed with ochreous hair; tarsi black; abdomen orange clothed with crimson hair at base, subdorsal, lateral and sublateral series of black spots, the ventral surface ochreous white. Forewing pale ochreous with a flesh tint, the veins and streaks in cell and submedian fold black; a strongly curved black antemedial line; a discoidal lunule; the postmedial line expanding into a small spot below costa, angled at vein 5 then strongly incurved; a fine black terminal line; cilia orange. Hindwing crimson with slight black discoidal lunule and some points on apical half of termen; cilia orange.

Hab. **Mashonaland,** Salisbury (Marshall). *Exp.* 54 mill.

2) Teracotona rhodophæa, Wlk. xxxi. 302 (1864).
Hab. **British East Africa,** Sabaki Valley; **Lake N'gami** (Anderson). *Exp.* 48–60 mill.

(3) Teracotona submacula, Wlk. ii. 472 (1855).
Spilosoma obscurum, Wlk. vii. 1696 (1856).
Diaphora natalica, Möschl. Stett. Ent. Ziet. xxxiii. p. 356 (1872).
Macronyx debilis, Feld. Reis. Nov. pl. 100, f. 2 (1874).
Teracotona roseata, Butl. P.Z.S. 1878, p. 382.
Hab. **Damaraland; Natal** (Gueinzius, Gooch). *Exp.* ♂ 48, ♀ 58 mill.

Genus PROCANTHIA, nov.

Type *P. argentea.*

Proboscis absent; palpi porrect clothed with rough hair; frons with large rounded prominence with sharp corneous spine in centre and curved corneous plate below it; antennæ of female bipectinate; head and thorax clothed with long rough hair some of those on thorax spatulate; tibiæ with the spurs short; abdomen dorsally clothed with rough hair at base. Forewing with the costa nearly straight, the termen obliquely rounded; vein 3 from near angle of cell; 4, 5 from angle; 6 from upper angle; 9 from 10 anastomosing with 7, 8 to form the areole. Hindwing with veins 3, 4 from angle of cell; 5 from well above angle; 6, 7 shortly stalked; 8 from middle of cell.

Procanthia argentea, n. sp.

♀. Palpi and frons yellow; vertex of head white at sides, grey at middle, some of the hairs tipped with black; thorax grey, tegulæ

edged with yellow, yellow spots on shoulders and metathorax, the spatulate hairs tipped with black; pectus and legs fuscous and grey, the latter with some yellow hair; abdomen orange-yellow, the hair at base and dorsal bands grey, lateral blackish bands, the ventral surface grey. Forewing silvery-white; two sub-basal black spots below costa and two below cell with some yellow between them; an antemedial yellow band edged on each side by black spots bent inwards in cell and angled inwards in submedian fold; a V-shaped black mark in cell towards extremity; a black line just beyond discocellulars; a yellow postmedial band edged by black spots, continuous on outer side, broken in places on inner, obliquely curved from costa to join the lower end of the line beyond cell and V-mark in cell, then erect to just above inner margin; a subterminal series of black spots; cilia pale yellow. Hindwing nearly pure white; cilia pale yellow at base.

Hab. **Cape Colony.** *Exp.* 46 mill.

Genus ANTARCTIA.

	Type.
Antarctia, Hübn. Verz. p 191 (1827)	*brunnea.*
Motada, Wlk. iv. 924 (1855)	*lateralis.*
Massicyta, Wlk. vii. 1712 (1856)	*fusca.*

Antarctia angustipennis, Wlk. iii. 767 (1855).

Hab. **Cape Colony.** *Exp.* 48 mill.

Genus GRAMMARCTIA.

	Type.
Grammarctia, Auriv. Ent. Tidskr. 1899, p. 243.	*bilinea*

Grammarctia bilinea, Wlk. xxxi. 237 (1864).

Hab. **Mashonaland**, Salisbury (Marshall); **Natal**, Durban (Bowker). *Exp.* 32 mill.

Genus RHODOGASTRIA.

	Type.
Rhodogastria, Hübn. Verz. p. 172 (1827) ...	*astreas.*
Amerila, Wlk. iii. 725 (1855)	*astreas.*
Canopus, Wlk. iii. 747 (1855), nec Fabr. *Hem.* 1803	*bubo.*
Phryganeomorpha, Wllgrn. Œf. K. Vet-Akad. Förhandl. xv. p. 214 (1858)	*astreas.*
Amblythyris, Mab. Bull. Soc. Philom. (7) iii. p. 137 (1879) non descr.	*vitripennis.*

Sect. I. (*Canopus*) Male with a tuft of hair between antennæ rising above vertex of head; forewing with the base of costa dilated into a large vesicle.

(1) Rhodogastria lupia, Druce, P.Z.S. 1887, p. 669 (1888).
Hab. **Delagoa Bay**; **Natal** (Gooch). *Exp.* 50 mill.

Sect. II. (*Rhodogastria*). Head of male without tuft of hair; forewing with the costa not dilated at base.

(2) Rhodogastria vitripennis, Blanch D'Orbigny, Dict. Hist. Nat. Atlas Zool. ii. Ins. Lep. pl. 13, f. 3. (1849).
Amblythyris radama, Mab. Bull. Soc. Philom. (7) iii. p. 137 (1879).
Pelochyta vidua, Saalm. Lep. Mad. i. p. 150, pl. 5, f. 52 (1884), nec. Cram.
Hab. **Madagascar**; **Natal**. *Exp.* ♂ 66, ♀ 70 mill.

(3) Rhodogastria astreas, Drury. Ill. Exot. Ent. ii. p. 28, f. 4 (1773).
Sphinx melanthus, Cram. Pap. Exot. pl. 286 B (1780).
Chelonia madagascariensis, Boisd. Delegorgue Voy. Afr. Austr. ii. p. 598 (1847).
Amerila rhodopa, Wlk. xxxi. 305 (1864).
Creatonotus communis, Wlk. xxxi. 283 (1864).
Amerila vitrea, Plotz. Stett. Ent. Zeit. xli. p. 84 (1880).
Rhodogastria fraterna, Moore, Trans. Ent. Soc., 1884, p. 356.
Amerila bauri, Möschl. Verh. Zool. bot. Ges. Wien. xxxiii. p. 289, pl. 16, f. 2 (1884).
Hab. **West Africa**; **Angola**; **Natal** (Gooch, Marshall); **Formosa**; **India**; **Ceylon**; **Burma**; **Bali**; **Bouru**; **Aru**. *Exp.* 46–74 mill.

Genus UTETHEISA.

	Type.
Utetheisa, Hübn. Verz. p. 168 (1827)	*pulchella.*
Deiopeia, Steph. Ill. Brit. Ent. Haust. ii. p. 92 (1829)	*pulchella.*

Utetheisa pulchella, Linn. Syst. Nat. i. p. 238 (1758).
Hab. Almost universally distributed in the Old World; **Mashonaland**, Salisbury (Marshall); **Transvaal** (F. Kirby); **Natal**; **Colony**. *Exp.* 34–46 mill.

Genus SECUSIO.

	Type.
Secusio, Wlk. ii. 558 (1854)	*strigata*
Galtara, Wlk. xxvi. 1688 (1862)	*purata*.

A. Hindwing orange.
  a. Forewing with the band formed by distinct white spots.. *strigata*.
  b. Forewing with the white band continuous and diffused .. *mania*.
B. Hindwing brownish white.
  a. Forewing with series of five postmedial black spots between costa and vein 3 .. .. *pustularia*.
  b. Forewing without postmedial black spots above vein 5 .. *pulverata*.
  c. Forewing without postmedial black spots .. .. *purata*.

(1) Secusio strigata, Wlk. ii. 559 (1854).
Nyctemera hymenæa, Gerst. Arch. f. Nat. xxxvii. p. 360 (1871). Van d. Decken. Reisen. iii. (2) p. 377, pl. 16, f. 1.
Secusio parvipuncta, Hmpsn. Ill. Het. B.M. viii. p. 46, pl. 139, f. 16 (1891).
Hab. **South India**, Nilgiris; **Aden**; **East Africa**, Zanzibar, Machakos, Kilim'njaro; **Natal**, Malvern (Marshall). *Exp.* 40 mill.

(2) Secusio mania, Druce, P.Z.S. 1887, p. 672 (1888).
Hab. **Delagoa Bay** (Mrs. Monteiro). *Exp.* 42 mill.

(3) Secusio pustularia, Wlk. xxvi. 1661 (1862).
Authora privata, Wlk. xxxii. 335 (1865).
Hab. **Natal** (Gueinzius); **Cape Colony**, Bushman's Lake (Alston), Capetown (Trimen). *Exp.* 34–40 mill.

(4) Secusio pulverata, n. sp.
♂. Head and thorax white, tinged with brown; palpi black at sides; antennæ with the branches brown; neck orange; tegulæ, patagia, pro- and meta-thorax with small black spots; tibæ at extremity and tarsi streaked with black; abdomen dull white, tinged with orange towards extremity, dorsal and two lateral series of black spots. Forewing dull white, striated with pale brown; a sub-basal black mark below costa and three ante-medial points in and above cell, an irregular brownish medial band from costa to submedian fold with a short black streak on it just above median nervure and spot above base of vein 2; a postmedial point above vein 7 with brownish mark above it on costa, two between veins 5 and 3, and one on inner margin; a terminal series of points with larger spot above vein 5. Hindwing white, slightly tinged with

brown, with traces of curved subterminal series of spots, more distinct on underside.

♀. Forewing with additional postmedial black point above vein 6.

Hab. **Natal, Karkloof** (Marshall). *Exp.* ♂ 46, ♀ 50 mill.

(5) Secusio purata, Wlk. xxvi. 1688 (1862).

Hab. **Cape Colony** (Sir C. Smith). *Exp.* 44 mill.

Genus PSYCHARIUM.

Psycharium, Herr Schäff. Aussereur. Schmett. p. 76 (1850).

Psycharium pellucens, Herr Schäff. Aussereur. Schmett. f. 461 (1850).

Hab. **Cape Colony**, Capetown (Claremont). *Exp.* 42 mill.

Family AGARISTIDÆ.

Key to the Genera.

A. Frons with long pointed corneous spine .. .. .. *Paida.*
B. Frons with rounded prominence.
  a. Palpi with the third joint porrect, long.
    a^1. Palpi with long pointed tuft at extremity of second joint .. .. *Ægocera.*
    b^1. Palpi with the second joint moderately fringed with hair.
      a^2. Palpi with the third joint fringed with hair below .. .. *Pais.*
      b^2. Palpi with the third joint naked .. .. *Xanthospilopteryx.*
  b. Palpi with the third joint upturned short .. .. .. *Hespagarista.*

Genus PAIDA.

Type.

Paida, Jord. Nov. Zool. iii. p. 96 (1896) ... *pulchra.*

A. Hindwing red with orange spot beyond the cell and terminal series .. .. *gordoni.*
B. Hindwing orange with black discoidal spot and subterminal line connected by streaks with termen .. .. *pulchra.*

(1) Paida gordoni, Butl. Ent. M. Mag. xvi. p. 10 (1879).

Hab. **Natal,** Tugela River (Lorimer), Estcourt (Hutchinson). *Exp.* 48 mill.

(2) Paida pulchra, Trimen, Trans. Ent. Soc. (3) i. p. 524 (1863).

Hab. **German South-West Africa,** Damaraland; **Transvaal,** Pretoria (Distant). *Exp.* 42 mill.

Genus ÆGOCERA.

Type.

Ægocera, Latr. Gen. Crust. Ins. iv. p. 211 (1809) ... ... *venulia.*
Charilina, Wlk. ii. 560 (1854)... ... ... *amabilis.*

Sect. I. Abdomen of male with lateral tufts of long hair from near base.

A. Hind tibiæ fringed with long hair.

(1) Ægocera fervida, Wlk. i. 57 (1854). Butl. Ill. Het. i. p. 12, pl. 5, f. 1.
Ægocera triphœnoides, Wllgrn. Wien. Ent. Mon. iv. p. 38 (1860).
Hab. **Natal,** Malvern (Marshall), Estcourt (Hutchinson). *Exp.* 52 mill.

B. Hind tibiæ with slight tufts of hair at middle and extremity.
a. Forewing strongly irrorated with white; hindwing with some white before the terminal black band.. .. .. .. *trimeni.*
b. Forewing irrorated with grey; hindwing without white before the terminal band .. .. *tricolor.*

(2) Ægocera trimeni, Feld. Reis. Nov. pl. 107, f. 15 (1874).
Hab. **Natal** (Trimen); **Cape Colony,** Annshaw (Miss F. Barrett). *Exp.* ♂ 50, ♀ 62 mill.

(3) Ægocera tricolor, Druce, Ent. Mo. Mag. xx. p. 155 (1883). Waterh. Aid ii. pl. 55, f. 2.
Hab. **West Africa,** Niger River; **British East Africa,** Wadelai, Voi, Sabaki Valley; **Transvaal,** Pretoria (Distant). *Exp.* ♂ 40, ♀ 50 mill.

Sect. II. (*Charilina*). Abdomen of male without lateral tufts of hair; mid tibiæ fringed on inner side, hind tibiæ on outer side with long hair.

(4) Ægocera amabilis, Drury, M. Exot. Ent. ii. pl. 13, f. 3 (1773).
Charilina intercisa, Feld. Reis. Nov. pl. 107, f. 17 (1874).
Hab. **West Africa,** Accra, Sierra Leone; **Abyssinia; British East Africa,** Uganda, Machakos, N'gtana; **British Central Africa,** Zomba; **Natal,** Mooi River (Marshall). *Exp.* 34–46 mill.

Auctorum.

Mitrophrys meraca, Karsch. Ent. Nachr. 1898, p. 332 ... ... German South-West Africa.

Genus PAIS.

Type.

Pais, Hübn. Verz. p. 279 (1827)... ... ... *decora.*

Pais decora, Linn. Mus. Ulr. p. 382 (1764). Cram. Pap. Exot. iii. pl. 219, F.G.
Noctua julia, Cram. Pap. Exot. i. pl. 7, E.F. (1775).
Brepha dubia, Hübn. Samml. Ex. Schmett. i. (1827).
Hab. **Natal**, Estcourt (Hutchinson, Burrows, Trimen). *Exp.* 50 mill.

Species Auctorum.

Pais moldænkii, Dew. Verh. L. C. Acad. xliii. p. 65, pl. 3, f. 15 (1881) ... ... Cape Colony.

Genus XANTHOSPILOPTERYX.

Type.

Xanthospilopteryx, Wllgrn. Œfv. Vet. Akad. Förh. xv. p. 82 (1858)... ... ... *superba.*

A. Abdomen with ventral orange bands.
  a. Abdomen with the ventral bands on last three segments orange.
    a^1. Abdomen with ventral bands on last three segments .. *perdix.*
    b^1. Abdomen with ventral spots on last three segments .. *pentelia.*
  b. Abdomen with the ventral bands on last three segments white .. .. *africana.*
B. Abdomen with sublateral series of white points.
  a. Hindwing with the black on costa extending to base .. .. *superba.*
  b. Hindwing with the black on costa not extending to middle *butleri.*

(1) Xanthospilopteryx perdix, Druce, P.Z.S. 1887, p. 668 (1888).
Eusemia eoa, Mab. Bull. Soc. Ent. Fr. (6) x. p. 123 (1890).
Hab. **British Central Africa**; **Delagoa Bay**. (*Exp.* 68 mill.

(2) Xanthospilopteryx pentelia, Druce, P.Z.S. 1887, p. 668 (1888).
Hab. **Delagoa Bay**. *Exp.* 50 mill.

(3) Xanthospilopteryx africana, Butl. A.M.N.H. (4) xv. p. 142 (1875).
Eusemia meretrix, Westw. Oates' Matabeleland, p. 355 (1881).
Xanthospilopteryx fatima, Kirby, Trans. Ent. Soc. 1891, p. 288, pl. 15, f. 2.
Hab. **British East Africa**; **Zululand**; **Natal** (Gooch). *Exp.* ♂ 64, ♀ 76 mill.

(4) Xanthospilopteryx superba, Butl. A.M.N.H. (4) xv. p. 141, pl. 13, f. 3 (1875).

Xanthospilopteryx geryon, Wllgrn Vet. Akad. Handl. (2) v. (4) p. 7 (1865). Nec. Fabr.

Hab. **Victoria Nyanza**; **British Central Africa**; **Portuguese East Africa**; **Mashonaland**, Salisbury (Marshall); **Matabeleland**, Tati (Schwesen); **Zululand**; **Natal**, Umfuzi River, Malvern (Marshall). *Exp.* ♂ 62, ♀ 66–80 mill.

(5) Xanthospilopteryx butleri, Wlk. Char. Lep. Het. p. 111 (1869).

Eusemia adulatrix, Westw. Oates' Matabeleland, p. 355, pl. G. f. 1 (1881).

Hab. **Matabeleland**; **Natal**, Pietermaritzburg (Miss M. Heaton). *Exp.* ♂ 50, ♀ 58 mill.

Genus HESPAGARISTA.

	Type.
Hespagarista, Wlk. i. 13 (1854)...	*echione.*

Hespagarista echione, Boisd. Voy. Deleg. ii. p. 595 (1847).

Angas, Kaffirs Illustrated, pl. 30, f. 10 (1849).

,, *interlecta*, Wlk. i. 14 (1854).

,, *interjecta*, Westw. Trans. Ent. Soc. (2) i. p. 203 (1877).

Eusemia novemmaculata, Mab. Ann. Soc. Ent. Fr. (6) x. p. 54 (1890).

Hab. **Delagoa Bay** (Kenrick, Mrs. Monteiro); **Natal**, Malvern (Marshall). *Exp.* 48 mill.

V.—*On the Anatomy of* Opisthopatus cinctipes, *Purc., with Notes on other, principally South African, Onychophora.*—By W. F. Purcell, Ph.D., *First Assistant.*

(Plates X., XI., XII.)

Since my previous paper on the South African species of Onychophora was written, the Museum has received several valuable contributions of fresh material, principally through the kindness of the Rev. J. R. Ward, the Rev. J. A. O'Neil, and Mr. W. Clark. The results of an examination of this material, and more especially of several living and preserved specimens of the male of *O. cinctipes*, which has not hitherto been described, are embodied in this paper, and appear to me to completely justify the separation of the last-named interesting form as a separate genus, connecting the Cape genus *Peripatopsis* with the mainly American genus *Peripatus*. The recent discovery by Bouvier of a West African species of the latter genus (*P. tholloni*, Bouv.) in the collection of the Paris Museum is, therefore, of particular interest.

For convenience of reference I have divided this paper into two portions.

I.—ANATOMICAL PART.

This part deals mainly with the comparative anatomy of *Opisthopatus cinctipes*, Purc., in particular that of the genital organs and the legs and the organs connected therewith, such as the coxal organs, the crural glands and the accessory glands of the male. The specimens at my disposal were those mentioned on pp. 106–107.

1. *The jaws.*

The jaws closely resemble those of *Peripatopsis* and certain species of *Peripatoides*. In both *Opisthopatus* and *Peripatopsis* each jaw is in reality composed of several (as many as four) hollow pieces of similar shape and equal size, encased one within the other (see

Sedgwick, 1888*b*, fig. 27, in which three such pieces are drawn, while in each of my figures, 6 and 6a, only the outline of one of four pieces has been given). Obviously new jaws are continually being formed within the outer ones, which drop off from time to time, and there are generally two or three such reserve jaws within each outer one. Similar reserve jaws are also known in other forms.

2. *The papillæ.*

The papillæ of the skin are best studied in drowned specimens and in sections. Each large papilla in drowned specimens is seen to be composed of a conical proximal portion and a darker and rather sharply marked-off distal portion. The distal part is either cylindrical (fig. 8c) or it is incrassated towards the apex (fig. 8b), which is somewhat flattened and bears a spine in its centre. On the legs long slenderer papillæ (fig. 8a) are also found. In spirit specimens the conical basal part of these papillæ is less evident, while the apex is often much flatter. Fig. 8d represents one of the smaller, club-shaped, flat-topped papillæ of the upper surface, common in spirit specimens.

For comparison outlines of the large papillæ from the sides of the body in *P. balfouri* (fig. 9) and *P. capensis* (fig. 10) are given.

The shape, structure, and distribution of the papillæ has recently been shown by Bouvier (1900*a*) to possess considerable systematic value in the American forms. I believe they will be found to afford some valuable characters in the South African species as well, when more carefully examined than has hitherto been done. For this purpose, however, it is necessary that only specimens which have been preserved in a similar manner be compared with one another, as the papillæ are liable to alteration in shape.

3. *The legs.*

I counted the legs in about thirty specimens and invariably found only 16 pairs. As in *Peripatopsis*, the legs diminish slightly in size towards each end of the body, but the last (genital) pair is subequal to the first pair of legs and is always perfectly developed and provided with 3 spinous pads; in this and in several of the preceding pairs, however, the proximal pad shows indications of its origin from a row of large papillæ (fig. 11). The actual size of the last pair of legs varies considerably in spirit specimens, these legs being sometimes large and long, sometimes much smaller and shorter, but as this is equally the case in both sexes these dif-

ferences in size cannot be regarded as a sexual character. In this respect these legs differ from the two posterior pairs in *Peripatopsis*, in which genus both are generally smaller in the male than in the female. In *Peripatopsis* also the legs of the last (genital) pair are always much smaller than the first pair in both sexes. In *O. cinctipes* the last pair of legs is used for walking in both the male and female.

The arrangement of the three large distal papillæ on the feet appears to be fairly constant, the dorsal one being placed exactly, or almost exactly, in the middle between the anterior and the posterior papilla, but sometimes nearer the former than the latter. The pair of large papillæ at the base of the foot is absent, as in the American forms (figs. 14 and 14a).

The proximal spinous pad of the 4th and 5th legs is interrupted by the nephridial papilla, which is quite separated from the two portions of the pad and either lies in a line with them or is slightly more proximal, as in fig. 12. The nephridial papilla is at the same time slightly posterior to the middle line of the leg, so that the anterior portion of the proximal spinous pad is larger than the posterior portion, although not so much larger as it appears in the figure, in which the whole of the posterior pad is not visible.

The nephridia of these legs are much enlarged as usual, and discharge at the apex of the nephridial papilla.

4. *The posterior region of the body.*

In the general appearance of the posterior part of the body *Opisthopatus* closely resembles the Australasian genus *Peripatoides*, especially such forms as *P. leuckarti* var. *orientalis* (Fletcher) from New South Wales (*cf.* figs. 2 and 3). In both these genera not only the postgenital segments, but also the genital segment itself, are considerably more developed than is usually the case in *Peripatopsis*. In the latter genus (figs. 4 and 5) these segments are generally much reduced, this reduction evidently going hand in hand with the abortion of the genital pair of legs. It must be remembered, however, that in a large series of specimens a certain amount of individual variation in the development of the posterior region is observable, which tends to bridge over the differences between the two genera in this respect. So, for instance, in *P. balfouri* the genital legs are placed much nearer to the hind end of the body than to the penultimate pair of legs in Sedgwick's figure 24 (1888*b*), while in several of our specimens they are

midway between the hind end and the penultimate pair. The condition in the latter case scarcely differs from that in *Opisthopatus*. Similarly in the genus *Peripatoides* there is a certain amount of variation amongst the different species. In *P. novæ-zealandiæ*, for instance, the postgenital part of the body is often relatively considerably larger than in our specimens of *P. leuckarti* var. *orientalis* (Fletcher).

5. *The coxal organs.*

The curious organs of unknown function to which Bouvier applied this name had been observed hitherto only in *Peripatus*, and their presence in *Opisthopatus*, therefore, forms a most interesting feature of the latter genus.

Externally they are best examined in specimens which have been distended by drowning in water,* and a description of their appearance and distribution in a large male from Richmond, prepared in this way, may serve as a typical case.

Fig. 14 is a carefully drawn view of the ventral surface of one of the legs and shows the coxal organ (*cx*) in its fully expanded condition, as it always appears in drowned specimens. It consists of a somewhat four-sided area of smooth ectoderm, occupying a large part of the ventral basal portion of the leg and protruding considerably above the level of the surrounding tissue in the form of a convex cushion or bolster.† There are no ordinary (primary) papillæ on this area, and even the minute secondary papillæ, which are so plentiful on the surrounding surfaces, are here entirely absent.

* Such specimens may subsequently be advantageously preserved in formaline, but drowned specimens do not yield as good material for sections as do ordinary spirit specimens.

† In this male specimen there are normally 4 rows of larger papillæ between the proximal pad and the distal edge of the coxal organ, about 4 rows on each side of the organ, and a single row, or at least space for a single row, between its proximal edge and the nephridial aperture (*n*). All of these rows have been carefully drawn in fig. 14. In most females, and to some extent in some of the males, rows of smaller papillæ are intercalated between these 8 to 9 rows so as to alternate with them. The total number of rows, therefore, between the proximal pad and the distal edge of the coxal organ varies from 4 (in some males) to about 6 or 7 (in most females). In the male from which fig. 14 was sketched the 2nd, 4th, 6th, and 8th rows, counting from the spinous pad, contained the largest papillæ and constituted the paler bands, while the 1st, 3rd, 5th, and 7th rows formed the dark bands, when such were present. In the females these 8 rows are easily recognised if this be borne in mind, in spite of the intercalated rows. I have never observed an intercalated row between the distal row of (dark) papillæ and the second row of larger (pale) papillæ in any specimen, although sometimes the row of dark distal papillæ may be quite obsolete ventrally in the middle.

A well-developed coxal organ was present in the specimen mentioned above in each of the legs from the 5th to the 14th pairs inclusive. On the first 4 pairs the organ was either quite absent or (on the 4th pair) present in a very rudimentary condition. A small coxal organ was present also on the 15th pair, but quite absent from the 16th pair (*cf.* fig. 11, which was drawn from the same specimen).

In another male from Richmond (also drowned) the coxal organ was absent from the 1st and 2nd pairs of legs, present on the 3rd right leg but absent from the left, quite absent from the 4th pair, very distinct on the 5th to 15th pairs inclusive, and absent from the 16th pair.

In a large female from Richmond (drowned) the organ was absent from the first 5 pairs of legs, present and normally developed on the 6th to 14th pairs, rudimentary on the 15th, and absent from the 16th pair.

In a large female from Dunbrody (in spirits) a distinct coxal organ was present on each of the first 15 pairs, but absent from the 16th pair of legs, those on the first 2 pairs being small, but those on the other legs very large and well developed.

The conclusion I draw from the above and from an examination of a number of other spirit specimens is that the coxal organ is normally absent from the last and often also from a varying number of the anterior pairs of legs (up to the first 5), but present on the remaining pairs.

In the living animal the coxal organ presents, when fully expanded, a smooth, somewhat translucent, shiny area, and appeared to be quite dry upon the surface. The whole organ can be completely retracted into the interior of the leg and expanded again apparently at the will of the animal, as I have repeatedly observed while handling living specimens. When the organ is retracted it forms a deep cavity with an oval to slit-like opening, which runs parallel to the axis of the leg and may be almost completely closed by the apposition of the adjacent papillose surfaces, bordering its anterior and posterior margins. In this case the organ becomes effectually hidden, and it is then impossible to tell from a mere external inspection whether it is present or not.

In spirit specimens the organ appears in all stages between complete retraction (fig. 23) and nearly complete expansion (fig. 22), although never so fully expanded as in drowned specimens. A very common condition is that shown in fig. 13, in which the peripheral parts are evaginated, but the central part retracted to

form a trough. Sections through such organs are shown in figs. 25 and 26.

In its histological structure the skin surrounding the basal organ (as well as that of other parts of the body) closely resembles that of *P. capensis*, as already described by Balfour (1883),—that is to say, each individual epithelial cell, whether it forms part of a primary papilla or belongs to the surface between the papillæ, is produced distally, so that its free end forms a convex or conical "secondary" papilla (or "scale," as Bouvier calls them; figs. 21–23). Each cell is again thickly covered with minute prickles on its exposed surface, but it does not terminate in a spine, except in the case of some of those on the larger primary papillæ. The transition to the epithelium of the basal organs (as at *x*, figs. 21 and 22) is quite abrupt; the prickles on the surface as well as the scales suddenly disappear, being replaced by a smooth thin cuticula upon the surface of which I could not discover any sculpturing whatever. In sections, however, this cuticula often appears wrinkled (as in fig. 23) or even partially detached from its matrix owing to the contraction of the latter. The cells of the matrix do not show any noticeable difference in the size or in the appearance of their nuclei, but their protoplasm appears striated, often even fibrous (fig. 22), much more distinctly so, in fact, than that of the surrounding echinate epithelium, in which the vacuolar or foam structure is more evident.

I failed to notice any peritoneal lining to the coxal organs, whose base, therefore, appears to be in direct contact with the blood in the leg cavity, and blood corpuscles (*bc*) may generally be seen in the neighbourhood.

Isolated muscular strands are attached to the bases of some of the matrix cells in the peripheral parts of the coxal organs and especially also to the ectodermal cells immediately adjoining these organs These muscles undoubtedly serve for the purpose of invaginating the whole organ into the cavity of the leg, from whence it may be protruded again by blood pressure.

From fig. 23 it will be seen that not only the smooth epithelium of the coxal organ, but also a considerable portion of the surrounding echinate skin is invaginated to form the deep groove at the base of the legs.

Peripatus.—Coxal organs in various states of expansion and retraction may be observed in most of the legs in the American species of *Peripatus*, and the variability of their appearance has already been frequently alluded to by various authors (Gaffron, 1883, Bell, 1883, Sedgwick, 1888*b*, &c.).

A brief but good description is given by Gaffron (1883, p. 51), according to whom the coxal organ forms a furrow with tumid lips, which may be closed or widely gaping. The epithelium lining the furrow is smooth (not tuberculate) and possesses a smooth cuticula but no "subepidermoidal layer."

Good figures have been given by Sedgwick (1888*b*, fig. 12) and quite recently by Wheeler (1898, figs. 5 and 7), which may be compared with my fig. 13.

In his recent paper dealing with 11 species and 2 varieties of *Peripatus*, Bouvier (1900*a*) states that he found these organs always present, although sometimes rudimentary in the most anterior and posterior pairs of legs. They assume various shapes, some being quite invaginated with the lips almost closed, others half evaginated in the form of a trough, like that in Sedgwick's figure, and others again quite evaginated and forming a voluminous vesicular appendage. The wall of the organ he describes as thin, and, in the case of one species (*P. trinidadensis*, p. 437), he further mentions that it is without the scale-like secondary papillæ, which cover the other parts of the body. Bouvier does not, however, state whether he examined the other species with regard to this last point.

Sclater (1887, p. 132) had previously already observed the protruded vesicular appendage in *P. imthurmi*, Sclat.

I have myself examined some sections of a West Indian species, *P. dominicæ*, Pollard (unfortunately not very well preserved for histological purposes), which showed that the basal organs very closely resemble those of *Opisthopatus*. Indeed I was unable to detect any differences worthy of note, excepting that the retractor muscles seemed more strongly developed. The scale-like secondary papillæ were entirely absent and the cuticula appeared to be quite without sculpturing, although somewhat detached and crumpled.

Coxal organs occur in two other extra-American forms, namely *P. tholloni*, Bouv., from Gabon, West Africa, and *P. sumatranus*, Sedgw., the locality of which is doubtfully given as Sumatra. Through the kindness of Professor Bouvier I have been able to personally examine a specimen of the former species, while in the case of the latter I conclude from Horst's figures and description (1886) that the structures called by him the "segmental grooves" can be nothing else but coxal organs. From what we know of both these species they must, for the present at any rate, be considered as belonging to the restricted genus *Peripatus*, with which they closely agree in all the essential characters that have so far been examined.

Other genera.—In the remaining genera no distinct coxal organ

occurs, although in its place a groove is often found such as that described by Sedgwick for *P. capensis*. In some sections cut transversely to the axis of a leg of *P. capensis* this groove was of considerable depth and resembled that which would be produced if the coxal organ in fig. 23 were removed and only the echinate portion of the invaginated ectoderm were left. It is quite possible that traces of a modified epithelium may sometimes be found at the base of this groove in some forms, representing the rudiments of a coxal organ. I have not, however, sufficiently investigated this point.

The function of the coxal organs is as yet unknown. They do not appear to be of the nature of a gland, nor of use in conjunction with sexual functions, as they are equally well developed in both sexes.

6. *The crural glands.*

The crural glands of *Opisthopatus* possess some peculiar characters apparently not yet noticed in other forms, although it seems probable that similar structures occur in *Peripatus*, as will be shown further on.

Unlike the ordinary crural glands of *Peripatopsis* these glands are very large and have, moreover, hitherto not been found in the female. They occur in the male in the 6th to 13th pairs* of legs inclusive, and may be easily seen when the animal is dissected under water. Each gland forms a long tubular pouch, ending blindly at its inner end, but passing over at the other end into a short duct, which opens externally at the apex of a large retractile papilla, situated on the ventral surface of the leg (fig. 26). The tubular pouch becomes somewhat attenuated towards its blind end and is thickest nearer the duct. It lies for by far the greater portion of its length within the lateral sinus of the body, and may be directed forwards or backwards more or less parallel to the nerve cord, which runs below it; or it may even be doubled back upon itself after running for a little distance in the one or other direction. The irregular arrangement of these tubes is well shown in fig. 15, in which they are drawn as they appeared in the dissected preparation. Those in the hinder part of the body reach scarcely beyond the bases of an adjoining pair of legs, but in the middle and anterior parts they are much

* This was certainly the case in two drowned males from Richmond, one of which was dissected and then sectioned, and in a male from Dunbrody, which was sectioned. In the remaining males, also, the external openings of these glands were never observed on the first 5 or last 3 pairs of legs.

longer and often extend beyond the adjoining pair to the bases of the second nearest pair of legs. Only a small part of the pouch is situated within the cavity of the leg itself. The course within the leg is shown in fig. 26, in which the gland passes first upwards and then inwards until it comes into contact with the dorso-ventral muscular septum (*dvs*) separating the mesial from the lateral sinuses. Here it bends abruptly forwards or backwards and runs along the upper side of the nerve cord in the lateral sinus. Opposite the cavity of the legs the gland lies in the triangular space situated between the nerve cord and the two dorso-ventral muscular septa, represented in the left side of fig. 25 (*dvs* and *dvs* ^{1}) and also indicated in fig. 26.

The duct is distinctly marked off from the tubular pouch, being much thinner than the latter, and it lies wholly within the leg cavity. Its walls are composed of a simple epithelium with small nuclei, and its inner contour is very sharp and distinct, apparently owing to the presence of a fine cuticula (fig. 26).

The wall of the tubular pouch, on the other hand, is an epithelium composed of large glandular cells about as high as thick and furnished with much larger nuclei. Within the pouch portions of coagulated secretion may be observed. A thin cellular layer, with small flattened nuclei, envelopes both pouch and duct, representing muscular and perhaps peritoneal cells.

The arrangement by which the ducts open exteriorly is peculiar, and may be best seen externally in drowned specimens, such as is represented in fig. 14. Bordering the distal half of the hind margin of the coxal organ (*cx*) in the 6th to 13th pairs of legs a large, bright brick-red and therefore very conspicuous fold of skin is observed, forming a ring-shaped tumid lip (*r.f*) round an opening. Owing to transverse constrictions the ring-fold appears as if composed of several separate tubercles, although in reality this is not the case. In the centre of a well-expanded ring-fold a large papilla may be observed, at the apex of which the duct of the crural gland opens. The papilla is only distinctly visible when its apex projects up to or beyond the level of the summit of the ring-fold, but in many cases when it is withdrawn below this level the papilla becomes externally invisible owing to the contraction of the ring-fold.

In the living animal the ring-fold and papilla may be readily observed in the conditions just described, and I even saw the central papilla protruded from the opening and again withdrawn on one occasion. Both ring-fold and papilla may, moreover, be completely withdrawn, apparently at the will of the animal, into the

leg, so that nothing remains to indicate the spot where it was situated, except a minute brick-red orifice. Such retracted papillæ are frequently found in spirit specimens, and I have also observed the actual process in the living animal. In its retracted condition the central papilla lies at the bottom of a deep cavity, which opens externally by means of a small brick-red orifice, exactly at the spot previously occupied by the papilla (fig. 21). The wall (*r.f*) of the cavity is simply the ring-fold invaginated and flattened out. The latter is, therefore, not a permanent structure, but merely produced by the evagination of the sac containing the retracted papilla.

The epithelium of the ring-fold and of the basal part of the papilla resembles that of the ordinary papillose skin of the leg, each cell having its convex or conical free end covered with numerous minute prickles. In its distal part, however, the papilla, although provided with scales, is not echinate on the surface, and the cuticula is distincter and thicker (fig. 21).

It is interesting to note that the ring-fold and papilla may be completely retracted, while the basal organ remains fully expanded; or both may be retracted together, in which case the ventral surface of the leg presents an appearance scarcely differing from that of the leg of a *Peripatopsis*.

I have never found any external trace of the papilla and ring-fold in any female specimen in the collection, and in two females which were sectioned they, as well as the crural glands, proved completely absent from all the legs examined (viz., the 6th to 16th pairs inclusive). I feel fairly certain that these organs are at least never present in the form in which they occur in the male, although from certain facts concerning their occurrence in *Peripatopsis*, which will be presently discussed, it appears quite possible that they may sometimes occur in a more rudimentary condition.

Peripatopsis.—The crural glands in this genus have been described by Balfour (1883), Moseley and Sedgwick (in Balfour, 1883), and Miss L. Sheldon (1889). They are dimorphous in the male, those of the pair of legs which immediately precedes the genital segment in this sex being enormously elongated and reaching forward to the middle of the body, while those of the other legs are small and lie wholly within the cavity of the legs.

I have examined sections of both kinds of glands in the males of *capensis* and *balfouri*. They resemble those of *Opisthopatus* but differ in the length of the glandular pouch, which is intermediate in size in the latter genus between the two kinds found in the former.

The duct of the enlarged glands of the pregenital pair of legs is

clothed throughout its length with a very thick muscular layer, which is indeed much thicker than the internal epithelium and evidently acts as a strong constrictor. The duct itself is compressed, its lumen being slit-like in cross-section, and it opens, as already stated by Moseley and Sedgwick (in Balfour, 1883), by means of a slit-like opening at the apex of a large whitish papilla, situated on the ventral surface. This papilla is relatively larger than the corresponding papillæ of the crural glands in *Opisthopatus*, and differs also in being non-retractile and not enclosed in a ring-like fold of epidermis. It is always conspicuous, and forms a well-known character for distinguishing the male.

A constrictor muscle, similar to that of the enlarged glands, only very much thinner and not more than two cell layers deep, clothes the ducts of the smaller crural glands, which also discharge at the apex of a distinct but smaller papilla, situated between the first and third rows of papillæ on the ventral surface of the legs (counting from the proximal pad) but not necessarily in the second row. This papilla may often be easily distinguished in spirit specimens, especially when the adjacent papillæ are pigmented, owing to its paler colour, or when a piece of coagulated secretion projects from the orifice at its apex. Sometimes the external opening is situated eccentrically at the edge of the broad apex of the papilla, but I have never observed it placed between the papillæ in either sex in any species (except perhaps in the case of *P. clavigera*).*

Both Balfour and Miss Sheldon state that crural glands are present in *P. capensis* in all the legs with the exception of the first pair, while the former author implies, and the latter distinctly states, that they occur in both sexes. According to Willey (p. 7), however, no crural glands were present in those legs of the female examined by him, and he suggests that perhaps the fat body in the legs has been confused with the glands. In order to ascertain whether crural glands were present or not, I made sections of legs, mostly chosen at random, from all the species of *Peripatopsis* with the following results :—

In a half-grown ♀ *capensis* (19 mm. long in contracted condition), sectioned from end to end, crural glands were quite absent from the first 5 pairs, but present and well developed in the 6th to 17th pairs inclusive. They resembled the corresponding glands of the male, excepting in the case of the 17th pair of legs, the glands of which

* The statement made by Willey (1898, p. 7), that only the openings of the enlarged pair of glands in the male of *P. capensis* are born on white papillæ is incorrect.

were smaller than those of the preceding pairs in the female, although corresponding as regards the position of the external openings in both sexes.

I also examined the 12th and 14th legs respectively of two full-grown females of *capensis*, but found no trace of the crural glands in either. Nor were any found in a specimen of *sedgwicki*, of which the 9th leg was sectioned.

In some sections through the hind end of a large ♀ *balfouri* a well-developed crural gland was found in the legs of the 17th pair, but none in the legs of the 18th pair, no other legs being sectioned.

Well-developed crural glands were also found in a large ♀ of *moseleyi* and of *leonina*, but only the 9th and 10th pairs of legs in the latter, and only the 17th in the former were sectioned.

In a large ♀ of *clavigera* a leg of the 11th pair was examined, and a rather small crural gland was found in the usual position. Its orifice was, however, not situated upon but next to a large papilla.

Of the male sex I examined only a few posterior legs in *capensis*, and the 10th to 18th legs inclusive in *balfouri*. In all these legs, excepting those of the genital segment, crural glands were found.

From the above facts it is evident that these glands are by no means constantly present in the females of *Peripatopsis*, and that they may be even present in a leg in some specimens, but absent from the corresponding leg in other specimens of the same species. These glands are equally well developed in both males and females of the same species (excepting of course those of the pregenital segment), and are evidently functional to an equal degree, as a rod like piece of secretion, evidently protruded and coagulated during the killing of the specimen in spirits, is often seen projecting through the orifice of the glands in both sexes. From this similarity it may be inferred also that they are subject to much the same amount of variation as to occurrence in the male as in the female. Whether they are ever entirely absent in the latter sex has not been ascertained.

Peripatus.—I have had no opportunity of examining the males of this genus. According to Gaffron one or two crural glands were present in each leg of the posterior pairs, which immediately precede the genital segment in the male of the American forms examined by him, but in the females these glands were absent. Each opens at the apex of a large white papilla placed on the ventral surface of the leg.

In his recent paper on *Peripatus*, Bouvier (1900*a*) describes the males of three species, in all of which he found these papillæ. These species are:—

(1) *P. sedgwicki*, Bouv., in which, according to Gaffron (1885), Sedgwick (1888*b*) and Bouvier (1900*a*), the papillæ occur on the 7 to 8 pairs of legs immediately preceding the genital segment. There are generally two present on each leg, except on the anterior ones, where they are present singly (see Sedgwick, 1888*b*, pl. 20, fig. 22).

(2) *P. dominicæ*, Pollard, and its var. *antiguensis*, Bouv., in which Bouvier found two papillæ on each leg of the two pairs immediately preceding the genital segment (pp. 422 and 431, pl. 5, figs. 4 and 5).

(3) *P. trinidadensis* Sedg., in which Bouvier found two papillæ on each leg of the antepenultimate pair and frequently also of the preceding pair (p. 437, pl. 6, fig. 6).

In every case, therefore, these papillæ and doubtless also the crural glands are absent from the postgenital and genital pairs of legs, but are present in the legs of the pair immediately preceding the genital segment and generally also in a varying number of the legs preceding these. The papillæ are very large and conspicuous and are always situated along the posterior border of the coxal organ. The distal one, which is placed next to the distal part of the hind margin of the coxal organ not far from the proximal spinous pad, coincides almost exactly in its position with those of *Opisthopatus* (compare my fig. 14 with those of Sedgwick and Bouvier mentioned above). It is also interesting to note that when only one papilla is present on a leg it is, according to Sedgwick, always the distal one.

Bouvier gives us some interesting information concerning the structure of these papillæ. He says they are formed of an annular pad-like elevation, in the middle of which is a projecting tubercle with what appears to be an orifice in its centre. This refers to *P. trinidadensis*, but his figures of *P. dominicæ* var. *antiguensis* show a similar structure. Now the resemblance of this structure to the evaginated ring-like fold and central papilla of *Opisthopatus* is so striking that one cannot but suspect that these organs are constructed on the same plan in both genera and that they may prove to be retractile in *Peripatus* as well. In Sedgwick's figure of this organ in *P. sedgwicki*, Bouv., the large outer ring-pad alone is shown, with a depression in the centre, the whole resembling in appearance the ring-fold in *Opisthopatus*, when the central papilla has been completely retracted. Moreover, in one of Gaffron's figures (1885,

fig. 26) the papillæ appear deeply retracted into the cavity of the legs.

In *P. trinidadensis*, according to Bouvier, the whole "papilla" (*i.e.*, ring-pad and central tubercle) is formed of a thin integument ree from scales, resembling that of the coxal organs. In this latter respect it would appear to differ from the condition in *Opisthopatus*, where the papilla and fold are both covered with scales.

Peripatoides.—Crural glands opening at the apex of pale papillæ appear to occur in most or at least some of the legs in the Australian and Tasmanian forms of *P. leuckarti* (Sänger), (*occidentalis* and *orientalis*, Fletcher, *insignis* and *oviparus*, Dendy, all of which, according to Fletcher, are varieties of *leuckarti*), and apparently also in the recently discovered New Zealand form *P. viridimaculatus* (Dendy) (1900). The white papillæ are situated on the ventral side of the legs. The glands of the legs of the genital segment will be considered further on.

According to Miss Sheldon (1889) crural glands are absent in the male of *P. novæ-zealandiæ*.

Paraperipatus novæ-britanniæ possesses no crural glands (Willey, 1898).

7. *The female genital organs.*

The young ova in the ovaries are contained in follicles (fig. 17) as in all the other genera except *Peripatus*.

The ducts consist of two tubes, which unite at their entrance to the ovaries and again just before the external opening (fig. 20).

*Receptaculum seminis.**—Near the ovarial end of each duct a small rounded lobe (*r.s*), less than the diameter of the duct in height, may be observed, caused by a simple loop of the inner epithelial tube, which here becomes somewhat attenuated (as is well shown in fig. 17). At the place where the angles of the loop are in contact the epithelial walls are very thin, and in a series of sections through the original of fig. 17, cut parallel to the plane of the paper, I found a small opening here (at *f*) allowing the lumina of the portions of the duct on each side of the loop to directly communicate with each other, independently of the longer channel of communication through the lumen of the loop. I found this opening in only one section and did not observe it in the loop of the other oviduct, so I am unable to

* This organ had previously escaped notice, owing to the defective preservation of the original specimen I dissected. It was, therefore, erroneously stated in my previous paper that there was no receptaculum in *O. cinctipes*.

say whether it is normally present or merely caused by defective sectioning. From appearances the latter seems to be the most probable supposition.

There can be no doubt that this loop is a much simplified form of the receptaculum seminis found in *Peripatus*, *Peripatoides* and *Paraperipatus*, in all of which the lobes are very much larger, owing to the considerable dilatation of the convex portion of the loop. In *Peripatus* (Gaffron, 1885) and *Paraperipatus* (Willey, 1898) the short direct communication between the portions of the oviduct on each side of the receptaculum is normal.

Gaffron has shown that this more complicated receptaculum owes its origin to a folding up of the oviduct, exactly resembling that which is the normal condition in *Opisthopatus* (see also Willey, 1898, text-fig. on p. 11).

In *Opisthopatus* the portion (*in*) of the duct which lies between the receptaculum and the ovary has very thick walls and a small lumen, differing in these respects from the part (*od*) on the other side of the receptaculum, where the walls are much thinner and the lumen much larger. Willey noticed a similar difference in the corresponding portions of the oviduct in *Paraperipatus* and he proposes the term *infundibulum* as a special name for the part lying between the receptaculum and the ovary (p. 10).

The principal interest in the simplified receptaculum seminis of *O. cinctipes* lies in the circumstance that it supplies an intermediate form between the more complicated organ of *Peripatus*, &c., and the condition in *Peripatopsis*, in which no receptaculum seminis occurs at all. For by slightly decreasing the size of the loop and then straightening out the latter, the receptaculum in *Opisthopatus* would vanish at once.

The embryos.—In the early segmentation stages the ova appear to be finely and densely vacuolated throughout and are provided with large nuclei. They are of comparatively small size, measuring less than ·1 mm. in lesser diameter, or apparently only about half that of similar ova in *P. balfouri*. I have, however, only seen the ova in sections, and cannot give the accurate dimensions.

I failed to observe any direct connection in any stage between the embryos and the uterine wall similar to that found in *Peripatus*. On the contrary, the former always appeared to lie free in its uterine chamber, although in contact with the walls of the latter at various places, and, as in *Peripatopsis*, part of the dorsal ectoderm is much thickened in certain stages. These stages in *Peripatopsis* have been described by Sedgwick, who considers that the thickened ectoderm

probably has the function of supplying the embryo with nutriment from the surrounding fluid (1888*a*, p. 54, pl. 7, fig. 25).

As I have previously pointed out the embryos vary much in size amongst themselves, those nearest the external orifice being evidently much older and much further developed than those nearer the ovarial end of the duct. This is well shown in fig. 20, in which, however, the oldest embryos are still comparatively small. In fig. 19 two embryos taken from the dissected type specimen are shown, and the largest of these, which lay nearest the external opening, is almost ready for birth, while the other is one of the smallest in the uterus. It is evident that the births of the young individuals take place at considerable intervals and in various months of the year, although I have not yet been able to ascertain the exact seasons.

In a recent paper Bouvier (1900*b*, p. 68) states that he has convinced himself that the females of several *Peripatopsis* contain embryos of various stages of development, differing in this respect from other forms of the genus, such as *P. capensis* and *balfouri*, which are remarkable for the uniformity of their development. Unfortunately Bouvier does not give particulars as to what extent he found these embryos to differ amongst themselves.

It may be advisable here to explain more fully the conditions which I have observed in the numerous specimens of *Peripatopsis* dissected by me (mainly belonging to *balfouri*, *capensis* and *leonina*). During the earliest period of the development, particularly in cleavage stages, it may be clearly demonstrated that the embryos of the same brood in one uterus form a series in successive stages of development, each one being slightly, although often scarcely perceptibly, more advanced than the embryo on the side furthest from the external sexual opening. The difference between embryos at opposite ends of the oviduct is, however, very distinct and noticeable in these early stages. In the later stages, when the legs have been formed, it becomes no longer easy to observe any difference, except perhaps a slight one in size, but at the time of birth the differences in development again become evident, for the young are not all born at the same time, but during a period extending over a number of days or even several weeks, only a small number being born on each day. I have myself observed this in *P. moseleyi* from Natal, and the Rev. J. R. Ward also informs me by letter that in his experiments on breeding this species one young seemed to be born each twenty-four hours, until the litter was complete.* A detailed account has been given by

* This observation has, I understand, been published in Journ. Quekett Micr. Club (2) vi., pp. 424–428, 1897.

Oakley (1884) of the birth of the young in two specimens of *P. capensis*, which may be repeated here :—

A ♀ found on 29th April, 1883, gave birth to 19 young, viz. :—
2 on 2nd May,
4 ,, 4th ,,
7 between 4th and 8th May,
1 on 21st May,
3 ,, 25th ,,
2 ,, 28th ,,
i.e., 19 during 27 days.

A ♀ found on 3rd May, 1883, gave birth to 23 young, viz. :—
4 on 6th May,
2 ,, 7th ,,
4 ,, night of 7th to 8th,
4 ,, ,, 8th to 9th,
2 ,, ,, 9th to 10th,
3 ,, 10th,
3 ,, 16th,
1 ,, 21st,
i.e., 23 during 16 days.

In view of Bouvier's statement I re-examined several other species of *Peripatopsis* but failed to find any case in which the embryos differed much from one another. For instance, in a female of *P. sedgwicki*, Purc., there were a considerable number of far-advanced embryos lying all round the intestinal canal over its whole length. All were pigmented and mostly of the same size, but a few were slightly smaller than the rest. One of the smallest and one of the largest embryos is represented in fig. 18, from which it is at once evident that the relative proportions here differ considerably from those of the two embryos of *Opisthopatus* represented in fig. 19.

From the same specimen of *P. sedgwicki* I removed a piece of uterus containing what I took at first to be an embryo very much larger than the others, but on dissecting away part of the wall of the duct in order to sketch the embryo I discovered that it was really made up of three separate embryos, all extended and overlapping and so closely appressed to each other that they appeared like a single one. As I cannot suppose that Bouvier made a similar mistake, nor that he was alluding to the two broods of successive years during the short period when both are present in the oviduct at the same time, it would be interesting to have some fuller information as to what he really saw.

8. *The male genital organs.*

The genital organs of the male were studied in a dissected drowned specimen from Richmond (fig. 15) and in a series of sections of a well-preserved spirit specimen from Dunbrody (fig. 25). The structure was the same in both, but the relative thickness of the

different parts differed somewhat, doubtless owing to the different methods of preservation.

Except as regards the accessory glands the genital organs resemble those of *Peripatopsis* in their general appearance. The sausage-shaped testes (*te*) are relatively stouter and shorter. They are bent only once in the shape of a hook and not irregularly twisted and curved about as in *Peripatopsis*, and they lie in the second third of the body. They are connected with the ellipsoid seminal vesicles (*s.v*) by a short, fine duct. Between the vesicles and the hind end of the body the very long vasa deferentia (*v.d*) lie coiled up irregularly in a thick mass. The common duct (*V.D*) of the vasa deferentia is rather short, but the paired ducts are very long, equalling about twice the length of the body in the drowned specimen.

The vas deferens passes over abruptly into a very muscular ductus ejaculatorius (*d.ej*), which forms a nearly straight, smooth, stout, cylindrical tube of a brownish-yellow colour and about the same thickness throughout. In both specimens this organ lay on the left side of the body, but its posterior end passed below the left nerve cord to the exterior orifice. The right vas deferens passed near its posterior end under both nerve cords immediately in front of the genital orifice to the left side of the body to enter the unpaired duct soon after. The posterior loop thus formed is shown in fig. 15.

Three sections passing through different parts of the ductus ejaculatorius are given in fig. 25, *d.ej*, and in fig. 27 to explain its structure. The powerful muscular sheath is present throughout its whole length but becomes considerably thinner near the anterior end. It encloses an inner tube with high columnar epithelium, whose lumen is cruciform in transverse section in its posterior part for some little distance from the external orifice (fig. 27a) but becomes 5- to 6-rayed farther forward (fig. 27b) and finally merely strongly compressed (fig. 25, *d.ej*). This latter is the condition in the whole of the anterior region of the ductus and its inner epithelial cells present here a granular, highly glandular appearance with small nuclei at their basal ends, but there is no internal cuticular lining. In the posterior region with 4- to 6-rayed lumen (fig. 27) the cells do not present a glandular appearance, and there is a distinct cuticula lining the inner tube.

Fig. 28 represents a section through the loop formed by the unpaired portion (*V.D*) of the vas deferens, cut along the line denoted in fig. 15. The walls of the tube are thinner and enclose a much larger lumen. The outer muscular sheath is not indicated in the figure, as it is extremely thin. In fig. 25 the right vas deferens is

cut twice in the region of the posterior loop just before ($r.v.d^2$) and after ($r.v.d^1$) it passes under the nerve cords (indicated by the line *x*.....*y* in fig. 15). It resembles the unpaired portion in section, except that its nuclei are larger and less numerous.

In my sections through the vas deferens the whole of the unpaired region and a considerable portion of the paired tubes contained a curious, highly stainable structure (*sper*, fig. 28), which appeared as if made up of numerous little vesicles densely packed together and surrounding one or several yellowish central bodies. At the place where the unpaired vas deferens branches this structure also branches into two, each branch being continued into the paired vasa. It was not present in the ductus ejaculatorius. The whole of this structure evidently represents a large elongated spermatophor and is composed mainly of a great number of closely packed spermatozoa, each of which apparently consists, as in *Peripatus*, of a highly stainable nuclear filament to which a rounded lump of slightly stainable protoplasm adheres, similar to those figured by Gaffron (1885, fig. 58). These adhering masses of protoplasm form the numerous vesicles referred to above, while the deeply staining meshwork between them is composed of the nuclear filaments of the spermatozoa. The nature of the yellowish central bodies could not be made out. The portions of the spermatophor lying nearest the testes are composed merely of closely packed spermatozoa, but more posteriorly, at least in the unpaired portion of the vas deferens, the spermatozoic mass is encased in a thin deeply staining sheath, but there is no external layer of granules corresponding to those found by Gaffron in *Peripatus*. At one place in the unpaired vas deferens the outer sheath of the spermatophor was suddenly and strongly constricted for a very short distance, and here its walls became very thick and its lumen narrow. There were no spermatozoa in the constricted portion, which thus resembled the narrower parts of the axial tube of the spermatophor of *Peripatus*, figured by Gaffron (1885, fig. 73).

Large elongated spermatophors have hitherto been found only in *Peripatus* and *Peripatoides*, in which genera the unpaired part of the vas deferens is enormously elongated, whereas in *O. cinctipes* this part is comparatively short.

9. *The accessory glands* of the male.*

The accessory glands of the male consist of four tubes, unusually complicated in structure and arrangement and opening externally by

* By accessory glands I mean only those which occur in the genital and post-genital segments of the male.

means of four separate pores, which are situated each at the apex of a large papilla.

These papillæ are arranged in two pairs. Those of the anterior pair are placed on each side of the genital papillæ close to the bases of the genital legs, while the posterior pair lie nearer together but at some distance behind the anterior pair. The exact position of these papillæ is accurately shown in fig. 11, *ac.g*^{1}, *ac.g*^{2}. They are all about the same size and are furnished with the usual minutely echinate scales on their surfaces. They are conspicuous in the living animal, especially the posterior pair, having the appearance of rounded pallid tubercles with an opening at the tip of each.

Each of the posterior glands consists of a duct (*r.ac.g*^{2}) nearly equalling the hinder portions of the paired vasa in thickness in the dissected specimen (fig. 15) and leading from the external pore to a large, elongate, collapsible, carrot-shaped vesicle (*r.v*), which considerably exceeds the ductus ejaculatorius in diameter. This vesicle tapers root-like at its posterior end, where it passes over into the efferent duct, but at the anterior end it is abruptly constricted and continued into a very fine short duct, which enters another elongate enlarged tube (*r.c*). At the end of the latter is a tubular appendage (*ap*), ending blindly and terminating the gland.*

In sections the efferent duct of the posterior glands may be easily recognised and distinguished from the numerous other tubes of this region of the body by the curiously jagged and irregular outline of its lumen, into which processes or ledges containing the nuclei project (figs. 30 and 31). A distinct muscular sheath is present.

Both large vesicles are shown in section in fig. 25, *r.v* being cut through the thickest part of the right vesicle and *l.v* through the thinner posterior part of the left one. The walls form a simple epithelium of cubical or even somewhat flattened cells with much larger nuclei than those of the duct. In each vesicle is a small quantity of coagulated secretion. It is evident that these vesicles are capable of great distension, as those in the dissected specimen (fig. 15) are about three times the actual thickness of those in the sections (fig. 25). The usual muscular coat is present but is extremely thin.

In the middle region of the gland the cells suddenly become elongated and the epithelium is therefore very thick (fig. 25, *r.c* and *l.c*).

* In the specimen dissected the two carrot-shaped vesicles lay on the left side of the body with their obtuse ends in front, while the middle and terminal sections of the glands varied in arrangement in the manner shown in fig. 15.

The epithelium of the terminal appendage (fig. 29) of the gland is also composed of cylindrical cells, but it is not so thick as the wall of the middle region.

The anterior pair of accessory glands (*r.ac.g*^{1} and *l.ac.g*^{1}) is much simpler in structure and consists of two long, fine, cylindrical tubes of about the same diameter throughout and as thick as, or somewhat thinner than, the efferent ducts of the posterior glands. For a portion of their length, equalling that of the carrot-shaped vesicle and its efferent duct together, the anterior glands lie free, but their terminal portion, which ends blindly, is always irregularly coiled in a single layer round the middle enlargement (*r.c* and *l.c*) of the posterior glands. The coil always commences at the constriction between the middle portion and the carrot-shaped vesicle, while the blind end of the tube may lie anywhere on the outer surface of the middle portion. The course of the coiled tube can be followed without any difficulty in dissected glands (see fig. 16) and I have ascertained with certainty from sections that there is no direct communication whatever between the lumina of the two glands in the region of the coil. A thin peritoneal covering (shown in fig. 25) envelopes the coil, as well as the other portions of the glands.

The sections through the right (*r.ac.g*^{1}) and left anterior gland (*l.ac.g*^{1}) in fig. 25 will give an idea of the structure of the different parts. The wall of the tube is formed of a simple epithelium of cubical or somewhat flattened cells, and the greater part of the lumen is occupied by coagulated secretion. It will be noticed that the coiled portions of the accessory glands form a mass which is considerably thicker than the carrot-shaped vesicles (*r.v* and *l.v*), whereas in the dissected specimen (fig. 15) exactly the opposite is the case. In reality the parts of both glands are about the same size in the two specimens, with the exception of the carrot-shaped vesicles, which are three times as wide in the drowned specimen as in the one preserved in spirits.

Peripatoides.—In *P. novæ-zealandiæ* the accessory glands consist of a pair of slender tubules with fine ducts, which discharge by separate external openings situated at the ventro-lateral angles of the body near the anus and therefore far behind the genital segment (L. Sheldon, 1889). In a specimen which I dissected these tubules extended forwards up to the level of the genital opening, where they are bent backwards or coiled about for a small portion of their length and end blindly.

According to Fletcher and Dendy (1895) a corresponding pair of glands with their external openings in a similar position occurs in the

males of the Australian and Tasmanian species, *P. leuckarti* and its varieties.

Besides these a second pair of glands, belonging to the genital segment, are said to occur in the various forms of *P. leuckarti*, but I have failed to find any adequate description of either these or the crural glands in the literature at my disposal. According to Dendy (1895, p. 200) the "accessory glands" of the genital segment in the larger Victorian form (*P. oviparus*, Dendy) open on a white papilla, which is situated in the angle between the leg and the body on each side of the genital opening. Sedgwick (1888*b*) had already mentioned the occurrence of a white papilla on the legs of the genital segment in the male of his Queensland specimens, which he referred to *P. leuckarti*. He states that the position of this papilla is the same as that of "the corresponding structure in the Cape males," but mentions nothing about its connection with a gland. Fletcher (1895) also found the papilla and states that when it occurs it is situated nearer the base of the leg than is the case with the papillæ of the crural glands on the other legs (p. 189). In his diagnosis of *P. leuckarti* (Säng.), (in which he includes all the Australian and Tasmanian forms), Fletcher states (p. 183) that a "crural gland" opens on the white papilla of the legs of the genital, as well as of the preceding abdominal segments.

Quite recently Dendy (1900) found the white papilla at the base of the leg of the genital segment in his new species, *P. viridi-muculatus*, from New Zealand.

It thus appears that a pair of glands, each opening on a white papilla situated at the base of the legs on either side of the male genital orifice, occurs in the various forms of *Peripatoides*, with the exception of *P. novæ-zealandiæ* (Hutton), in which, according to Miss Sheldon (1889), these glands are absent.

It would be of interest to know whether these glands of the genital segment resemble the crural glands of the other legs, or whether they have become specially modified like the corresponding glands in *Opisthopatus* and *Peripatopsis*. If the former be the case, then *Peripatoides* would be the only form known in which unmodified crural glands are present in the legs of the genital segment; if the latter, the genus would share with *Opisthopatus* the peculiarity of possessing in the genital and postgenital segments of the male two pairs of accessory glands, different in form from the crural glands of the pregenital pairs of legs.

According to Fletcher it would appear that the "crural glands" (as he calls them) of the legs of the genital segment, like those of

individual legs in other parts of the body, are not always present. This would indicate that these organs are all similar to one another, and physiologically of minor importance, like the crural glands in the females of *Peripatopsis*, in which they may be absent or present in corresponding legs of different individuals of the same species. In any case the accessory glands of the genital segment in *Peripatoides* very closely resemble those of *Opisthopatus* in the position of their external openings, hence the importance of knowing how far they resemble the crural glands of the other legs in the former genus.

Peripatopsis.—In this genus only a single pair of accessory glands occurs, the openings of which are situated in the genital segment. The glands of *P. capensis* were first drawn by Balfour and described by Moseley and Sedgwick (in Balfour, 1883, p. 36, fig. 43), and subsequently by Miss Sheldon (1889). I have myself examined them in *P. capensis* and *balfouri*.

They form a pair of short blind tubes, the walls of which are composed of a high epithelium covered by a very thin layer of flat-nucleated cells, evidently muscular in function. Altogether they closely resemble the enlarged crural glands, when seen in cross-section. They pass over gradually into the ducts, which are very fine—much slenderer, in fact, than the ductus ejaculatorius, the walls of which they pierce, as correctly stated by Willey (1898, p. 17). Each duct discharges separately into the lateral wings of the ductus ejaculatorius near the posterior extremity of the latter, the lumen of which exhibits here a cruciform transverse section (see below, p. 93).

Peripatus.—In this genus, according to Gaffron (1885) and Kennel (1886, p. 71), the accessory glands (or "anal glands," as they are usually called) of the male form a pair of pear-shaped vesicles with two ducts, which discharge each into a chamber, opening separately on each side of the anus. No accessory glands have, as yet, been found in the genital segment itself.

Paraperipatus.—In the male of this curious form, according to the recent investigations of A. Willey, a pair of accessory glands ("pygidial glands") occur, which discharge into a common muscular bulbus situated immediately above the rectum, and itself opening externally on the dorsal surface just in front of the anus. In this form the genital segment has lost its pair of limbs, and it is not quite clear whether the accessory glands are postgenital or not.

Phylogeny of the accessory glands in Onychophora.—(*a*) The *accessory glands of the genital segment* are plainly morphologically equivalent to, and serially homologous with, the crural glands, since the nephridia of this segment have been shown by Kennel and

Sedgwick to be represented by the ducts of the genital organs. This homology is very evident in *Peripatoides* and *Opisthopatus*, in which these glands open on or near the bases of the genital legs. In *Peripatopsis*, however, this is not the case, and its single pair of accessory glands have been generally considered homologous with the anal glands of *Peripatus*, which are modified nephridia. Such, for instance, is the expressed opinion of Korschelt and Heider (1892) and A. Willey (1898, pp. 16 and 17). The objection to this view is, of course, the fact that these glands discharge into the ductus ejaculatorius and not posterior to it; but this difficulty is ingeniously surmounted by Korschelt and Heider, who assume (pp. 715 and 716) that the postgenital portion of the body, which must originally have been as much developed as in *Peripatus*, has been so completely reduced that the anal glands and the genital opening now apparently lie in the same segment. The absence of glands in the genital segment in *Peripatus* and of postgenital glands in *Peripatopsis* also doubtless appeared to justify the view that the accessory glands of both genera must be identical. As we now know that accessory glands may occur in both genital and postgenital segments in at least two genera, there is obviously no necessity for adopting Korschelt and Heider's theory.

(*b*) The *accessory glands of the postgenital segments*.—Except in *Peripatus* the morphological value of the posterior pair of glands is by no means so clear as in the case of the anterior pair.

In *Peripatus* the genital segment is followed by two segments, the first of which is complete and bears a leg and nephridium on each side, while the second or anal segment, although without legs, possesses in the embryo, according to Kennel's investigations (1886, pp. 70 and 71), a pair of nephridia, which later on disappear in the female but develop into the accessory or anal glands in the male. Since the postgenital legs may originally have also possessed crural glands, it is evident that the postgenital glands in the other genera may have been derived from—

(*a*) These crural glands,

(*b*) The nephridia of the first postgenital segment,

(*c*) The nephridia of the second postgenital segment,

assuming that all the forms originally possessed two postgenital segments. Sedgwick (1888*a*, p. 98) found rudiments of two pairs of postgenital somites in the embryos of *Peripatopsis capensis*, but he states that they vanish completely in stage F. With them, of course, would vanish the postgenital glands in this genus.

In *Peripatoides*, or at least in *P. novæ-zealandiæ*, the posterior

accessory glands correspond best with the anal glands of *Peripatus* in the posterior position of their external openings, and both glands are generally considered homologous and therefore nephridial in origin (*cf.* figs. 1 and 2).

In *Opisthopatus* the posterior accessory glands being farther forward (*cf.* fig. 3 with figs. 1 and 2) would appear to correspond better with the anterior pair of postgenital nephridia in *Peripatus*, especially as their complicated form (the division into three parts and the vesicular carrot-shape of the basal part, from which the efferent duct leads to the exterior) gives these glands in *Opisthopatus* a striking resemblance to a nephridium, as depicted by Gaffron (1883, fig. 28) or Balfour (1883, fig. 28). The similarity in the mode of opening in the two pairs of glands in *Opisthopatus* cannot be used as an argument in favour of their similar origin, since nephridia may also discharge at the apex of a papilla (for instance, in the 4th and 5th pairs of legs).

10. *The external sexual openings.*

Male.—The ductus ejaculatorius opens externally by means of a cruciform orifice with four subequal arms, corresponding to the arms of the lumen and situated between four small spinous pads, which are generally closely approximated to each other in the live animal and in spirit specimens (fig. 7 ♂), but are pushed widely apart by the evagination of a portion of the ductus in the drowned specimen drawn in fig. 11. These four pads are very characteristic of the male, as they are not found in the female, and they form a good character for distinguishing the sexes in this species. They closely resemble the spinous pads of the legs in structure, and have the form of four non-retractile and easily distinguishable tubercles, bearing on their surface a number of spines and numerous scales, but no primary papillæ.

Female.—In the female the cruciform nature of the sexual orifice (fig. 7 ♀) is much less evident, owing to the reduction of the longitudinal (median) slit, which being inconspicuous and generally not readily distinguishable, except in sections, quite escaped my notice when the type specimens were first examined and described. The transverse slit, on the other hand, is very large and conspicuous, much larger, in fact, than in the male. The lips of the orifice, as stated above, differ from those of the male in having no spinous pads, but there are a number of ordinary papillæ in the immediate neighbourhood, each bearing the usual single spine. In the live

animal the edges of the orifice are on a level with the ventral surface, but in spirit specimens they are generally more or less raised to form a prominent eminence, bearing the orifice at its summit and papillæ on its sides.

When *Opisthopatus* was first described there were no males and only two indifferently preserved female specimens at my disposal, and the apparently purely transverse sexual orifice seemed to be strikingly different from that of the females of *Peripatopsis* and other genera, so far as the form of the opening could be ascertained from the literature on the subject. A subsequent careful examination of a number of specimens of various species has convinced me that, after all, these differences are of quite minor importance, as the cruciform orifice is common to several genera.

Peripatoides.—In a number of females of *Peripatoides leuckarti* var. *orientalis* (Fletcher), which were collected in New South Wales and beautifully preserved (evidently by drowning) by Mr. Th. Steel, the genital orifice was very distinctly cruciform, the shape being produced by a longitudinal and a transverse slit cutting one another at right angles. In at least one specimen, however, the anterior arm of the longitudinal slit was quite obsolete, the opening being then T-shaped.* The lips of the slits are, like those of a preserved *Opisthopatus* ♀, more or less raised to form an eminence, bearing the orifice at its summit and a number of ordinary papillæ on its surface, but no spinous pads are present. The orifice, therefore, differs from that of the male *Opisthopatus* only in the circumstance that in the latter the cruciform opening is contained between four spiniferous tubercles instead of four tumid lips bearing primary papillæ; while it differs from the opening in the female *Opisthopatus* only in having the longitudinal slit much more strongly developed, and generally about as large as the transverse one, the tumid lips being similar in both cases.

I also examined four smaller male specimens (one of which I dissected) and two larger female specimens of *P. novæ-zealandiæ* from near Wellington, N.Z. These specimens had evidently been preserved in spirits without previous drowning. The sexual opening, which was situated at the apex of a considerable eminence, had in most cases the form of a longitudinal slit, which in one of the females and in one or two of the males was bisected by a smaller transverse slit, not detected in the remaining specimens. The surface of the genital eminence was covered in the female with a

* On opening these specimens they proved to be females like the others. I do not know the male of this species.

number of ordinary papillæ, bearing each a spine at the apex, but in the male these papillæ, although still distinguishable, were very low, giving the eminence under a low magnifying power the appearance of a true spinous pad. This seems to constitute an easy means of distinguishing the sexes in this species, although Sedgwick states that they are externally indistinguishable. The orifice was also more gaping in the female than in the male.

Peripatopsis.—In the synopsis of the characters of this genus, given in my previous paper (1899, p. 335), the genital opening is described as longitudinal but never transverse. This statement was based on an examination of the females, and was intended for comparison with the female of *Opisthopatus*, but does not apply to the males of two species, viz., *P. capensis* and *P. moseleyi*.

I have since then examined by means of horizontal sections and otherwise a number of males of *P. capensis*, and find that the genital opening in this species very closely resembles that of the male of *O. cinctipes*. The orifice is very distinctly cruciform with four equal arms, situated between four prominent and well-developed spinous pads. The two anterior pads are slightly larger, and are placed between the rudiments of the legs of the genital segment, while the two posterior pads lie behind them in such a manner that the transverse part of the orifice, if produced, would just touch the hind surface of these legs. The cruciform orifice leads into the ductus, the lumen of which, like that of *O. cinctipes*, also appears cruciform in cross-section in its most posterior part.

In *P. moseleyi* the condition is exactly similar.

In the females of *Peripatopsis* the sexual orifice is essentially a longitudinal opening, the lips of which bear ordinary papillæ but no spinous pads. Occasionally, however, the lips are bisected by a shallow groove, but I have never observed a true cruciform opening.

Peripatus.—I have not sufficient material of this genus for the purpose of an investigation, but it may be mentioned that according to Horst (1886, p. 39, pl. 2, fig. 4) the genital opening of *Peripatus sumatranus*, Sedgw., is cruciform and situated between four tubercles in the type specimen.

From the above it is evident that the cruciform sexual opening is the normal form in at least one or the other sex of some of the species in each of the three Cape and Australasian genera, and may be looked upon as the primitive condition, from which a transverse or longitudinal opening has been derived in one of the sexes (mostly the female) by the more or less complete reduction of the longitudinal or transverse portion respectively of the opening.

11. *The relation of the external sexual opening to the posterior legs in Onychophora.*

The differences in the position of the external sexual opening in the various *Onychophora* (*cf.* figs. 1–5), especially between such forms as, for instance, *Peripatopsis balfouri* (fig. 4), with the sexual opening between the last pair of legs and *Peripatus edwardsi*, &c. (fig. 1), with the opening between the penultimate pair, is very striking, and may have originated in two ways.

One possible explanation is to assume a direct transposition of the genital orifice from one position to the other. There is, however, no evidence to support this view, and against it is the circumstance that the position of the genital opening is always perfectly constant in its relation to the posterior legs within the limits of the same species. Thus, in the American *Peripatus*, the opening always lies between the penultimate pair, no matter how much the total number of legs varies in the species.

The second, and, I believe, the only correct explanation, is that given by Korschelt and Heider (1892, p. 716), and quite recently by Bouvier (1900*c*), who assume that the posterior legs and the postgenital segments of the body have been more or less or even completely reduced, causing the genital opening to acquire thereby an apparently more posterior position. Several strong arguments in favour of this view may be adduced. Thus in *Peripatopsis capensis* Sedgwick found two pairs of postgenital rudimentary somites, which Korschelt and Heider (p. 716) homologise with the two postgenital segments of the adult *Peripatus* (also corresponding, according to Kennel, to two pairs of postgenital somites in the embryo). It has further been clearly demonstrated that the posterior (genital) pair of legs in *Peripatopsis* are subject to great variation as regards their degree of development,* both within the limits of a single species and in the different species taken together, and every intermediate stage may be shown to occur, from the perfectly formed, although small-sized, legs of some specimens of *P. sedgwicki*, Purc., to the conditions sometimes found in *P. capensis* and *moseleyi*, where the two posterior legs may be so reduced that one or both of them are completely aborted and no longer distinguishable. From this last condition to an imaginary one in which the legs of the genital segment no longer appear in any of the specimens is but a step, and we would then have a clear case in which a form with the genital

* Bouvier (1900*c*) makes use of this argument in this connection.

opening lying behind the last pair of legs has been evolved from forms which had this opening between the legs of the last pair.

Direct evidence of former postgenital legs is afforded by the presence in the males of most of the genera of accessory glands, representing nephridia (or possibly crural glands) of postgenital segments. The question as to whether these glands are derived from nephridia or from crural glands is immaterial, as in either case they would be indicative of the former existence of appendages on the segments in which they occur.

12. *The ancestral form of the Onychophora.*

If the views set forth in the preceding paragraphs are as correct as I believe them to be, it is evident that the nearest approach amongst living Onychophora to the common ancestral form, as regards the development of the posterior segments of the body, is to be found in the genus *Peripatus*, as represented by *P. edwardsi*, *trinidadensis*, and numerous other, mainly Neotropical, forms (see fig. 1). The condition of these segments in the other genera have, therefore, originated by the successive reduction of posterior legs, glands, and segments, as may be at once seen by comparing the diagrams given in figs. 1–5, bearing in mind, however, that the ancestral form doubtless also possessed crural glands in the genital segment from which the accessory glands of that segment in certain living forms have been derived. And I am strongly inclined to believe that in respect to various other parts of their organisation the general tendency in the Onychophora has also been towards simplification and reduction. The organisation of *Peripatus* is certainly the most complicated of all living Onychophora, and we would, I believe, be justified in considering the form of any particular organ as it appears in this genus to-day, as probably (although, of course, not necessarily) more nearly like that of the ancestral form than the same organ in another shape in a different genus would be. With regard to some organs, this appears fairly clear; thus the coxal organs, the elongate spermatophors, and the more complicated form of receptaculum seminis, are probably primitive, and have been lost in those forms which do not now possess them. In the case of certain other organs, however, such as the receptaculum ovorum and the non-follicular ovary, which are peculiar to the genus *Peripatus*, it is impossible at present to form an opinion as to whether they represent primitive or newly-acquired characters.

As is well known, remarkable differences also exist in the structure

of the ova and the contrivances by which the nutrition of the embryo is effected in different Onychophora. Thus four distinct types have been described, which form a series in the following order: *Peripatus*, *Paraperipatus*, *Peripatopsis*, and *Peripatoides*. At one end of the series is *Peripatus*, with very small and yolkless ova, and with its embryos attached to the uterine wall by a dorsal organ, by means of which they receive nourishment, while at the other end is *Peripatoides*, with very large ova provided with abundant food-yolk, and with embryos which have no special ectodermal organ for the purpose of nutrition.

Without taking other things into consideration, one would perhaps at first feel inclined to agree with Korschelt and Heider (1892, p. 678) in considering the condition in *Peripatoides* the most primitive one, from which the more complicated method of embryonal nutrition observed in *Peripatus* (and *Paraperipatus*) has been derived. It is, therefore, of the greatest interest that A. Willey, in his recent studies on the development of *Paraperipatus novæ-britanniæ*, has come to the conclusion that there is nothing whatever to show that the small yolkless eggs of *Peripatus* and *Paraperipatus* ever possessed food-yolk, and in an interesting discussion on this subject (p. 33 ff.) he distinctly favours the view that the yolk-laden eggs of *Peripatoides* have been secondarily developed within the Onychophora, and do not represent the primitive condition, contrary to the views expressed by Korschelt and Heider.

II.—SYSTEMATIC PART.

This part deals more especially with the colour variations, the number of the legs, and the distribution of the various South African Onychophora, and embodies mainly information which I have obtained since the completion of my previous paper, to which it forms a supplement. Of more particular interest are the variations observed in the young of *P. moseleyi*, bred in the Museum from specimens kindly sent us by the Rev. J. R. Ward.

1. *Variation in colour.*

The species of both South African genera (with the exception, so far, of only two species) vary as regards the ground colouration of their dorsal and lateral surfaces within almost exactly the same limits, namely, from a deep velvety black, greenish black, or dark green, to a light brick-red (terra-cotta). The latter agrees very closely with the colour termed *testaceus* in Saccardo's Chromotaxia

(1894), and with that of the terra-cotta paper covers in which the parts of these ANNALS are bound. This colour varies from a lighter to a darker terra-cotta, according to the amount of black or dark green mixed with it, and I formerly described it as orange-brown, orange-red, or even orange, according to tint, while Sedgwick called it brown, reddish brown, and red-orange. Oakley (1884, p. 35) used the more correct term, "dusky brick-red," as well as brown.

In living forms many variations of colouration occur, but these may be generally grouped under four principal heads as follows:—

(1) *Brick-red forms.*—Sides and upper surface of the trunk of the body appear of a brick-red (terra-cotta) colour to the naked eye, the lateral band above the legs on each side being of a paler and purer brick-red than the rest of the dorso-lateral surface, in which a certain amount of dark pigment (absent in the light lateral bands) is mixed with the red, without, however, forming conspicuous black lateral stripes (*moseleyi*, *capensis*, *cinctipes*).

(2) *Brick-red forms with lateral black stripes.*—Trunk of body as in the brick-red form, excepting that there is a larger amount of dark pigment forming a conspicuous black (or dark green) stripe of varying width on each side just above the light lateral band (*moseleyi*, *capensis*, *sedgwicki*, *cinctipes*).

(3) *Black or dark green forms with red sides.*—Black pigment still more plentiful than in the last form, completely obliterating the red stripes of the dorsal surface proper; only the light lateral bands above the legs pale brick-red, the rest of the dorso-lateral surface of the trunk of body black or dark green but provided *with numerous large reddish papillæ*, evenly scattered about amongst the black ones. An excellent figure of this type is given by Sedgwick (1888*b*, pl. 17, fig. 8) (*moseleyi*, *capensis*, *sedgwicki*, *cinctipes*).

(4) *Black or dark green forms* —Whole dorso-lateral surface dark green or black, the lateral band on each side above the bases of the legs paler and more distinctly green; red pigment of the dorso-lateral surface limited to the larger papillæ; these red papillæ either distributed over both the dorsal and lateral surfaces, often forming more or less distinct transverse and longitudinal rows (*balfouri*, *leonina*, *clavigera*, *capensis juv.*, *cinctipes*), or the red is less developed or even entirely absent in the strictly dorsal papillæ, and principally or entirely confined to those on the sides, especially those in the light suprapedal bands (*moseleyi*, *capensis*); red pigment rarely entirely absent (*moseleyi*, *capensis*, *balfouri*). In these dark pigmented specimens reddish tinges are sometimes observable in the living animals, due to the presence of much soluble red pigment,

which is rapidly and completely extracted by spirits (*capensis*, *balfouri*).

In the above no account is taken of the legs, as their colour varies with the species rather than with the colour of the trunk. The dorsal surface of the legs almost always retains much dark green or black, even in the reddest specimens; red papillæ may be present or absent according to the species, and sometimes also according to the locality in which it was found.

The narrow black medio-dorsal stripe, divided longitudinally by a fine white median line, is always present and well defined, even in the darkest specimens, and there is generally also a dark stripe on each side joining the bases of the legs.

The antennæ have always much dark pigment, although often with admixture of red.

The skin between the papillæ on the head is sometimes pallid (*balfouri*), and occasionally orange-yellow (*cinctipes*). White-headed varieties, in which the greater part of the head is devoid of pigment, sometimes occur (*moseleyi*, *balfouri*).

The red pigment appears to be present in several modifications. Thus in *balfouri* and *leonina* from the Cape Peninsula the red of the papillæ soon dissolves in spirits, whereas red specimens of *sedgwicki* and *moseleyi* still retain the red of the dorso-lateral surface after an immersion of four years and longer, even when exposed to light. The colour is, however, not so bright as it was originally, and is evidently gradually fading. Readily soluble and insoluble red pigment may even occur in specimens of the same species. Thus a large brick-red and a smaller greenish-red specimen of *capensis*, found at the same time and place, were put into spirits, with the result that the large species is still brick-red after nearly a year, while the smaller specimen lost almost every trace of its red within a few days and became dark green.

The reddish pigment of the ventral surface was always of the soluble kind in the various species in which it was found.

With regard to the distribution of the red and the dark varieties of the same species, it appears that some localities produce only black or dark-green specimens; others both black and red ones; others, again, apparently only red specimens. Thus *capensis* from the mountain-sides at St. James (False Bay) and Platteklip (Cape Town) is black, but specimens from the flatter country on the Peninsula (Diep River, Plumstead, and Wynberg) are frequently, perhaps mostly, red or reddish.

No red specimens of *leonina* and *clavigera* have as yet been found.

The former is known, however, only from a single locality (Lions Hill), and of the latter I have seen only four specimens; so it is very probable that, when more specimens become known from other localities, these two species also will be found to vary in colour, like the others of the genus.

2. *Peripatopsis capensis* (Grube, Sedgw. emend.).

I have to record five new localities for this species:—

(*a*) Hottentots Holland Mountains, Caledon Div. I found a couple of specimens under stones alongside a small stream on the south-east slope near the summit. There were no trees of any sort near this locality, the ground being perfectly open. One of the specimens was of a brick-red colour with dark upper lateral stripes, just like type No. 2 (described on p. 97). The other specimen was reddish green, becoming pure green in spirits.

(*b*) Frenchhoek, in the Paarl Div. I found a single specimen under a log near Mr. Kriel's Boarding House.

(*c*) Houw Hoek, Caledon Div. I found 4 reddish specimens (belonging to colouration type, No. 2, p. 97) and 1 black one, all with 17 pairs of legs, in the ravines in the middle of August.

(*d*) Caledon. Sixteen ♂ and 5 ♀ under stones in the Venster Ravine (collected by Mr. and Mrs. Ewald Watermeyer, my wife and myself, in the middle of August), all with 17 pairs of legs and mostly darkly coloured.

(*e*) Swellendam. Four ♂ and 4 ♀ with 17, and 4 ♂ and 2 ♀ with 18 pairs of claw-bearing legs found by Mr. H. A. Fry and myself in the forest on the mountain-side near the town. They varied in colour from blackish blue to greenish brown. Those with 18 pairs of legs resembled the normal *capensis* from the Cape Peninsula in size, width of middle spinous pad, structure of genital segment, and shape of dorsal papillæ, and are undoubtedly mere local varieties of this species.

3. *Peripatopsis moseleyi* (Wood-M.).

In my previous paper several specimens from the Katberg Forest and from Richmond were briefly noticed and doubtfully referred to as possible new species (Nos. 4, 5, and 6 on p. 340) on account of the presence of a distinct although clawless and rudimentary foot on the rudimentary leg on each side of the genital opening. These specimens possessed 20 or 21 pairs of claw-bearing legs, while several

specimens from Estcourt, in which the foot of the rudimentary legs was apparently obsolete, possessed 22 pairs, and were referred by me to *P. moseleyi*.

I have since received a number of living specimens from the Rev. J. R. Ward, collected at Richmond, Natal, and from an examination of these I now feel convinced that all the specimens alluded to above as doubtfully new, together with those from Estcourt, are specifically identical with *P. moseleyi*.

In these Richmond specimens I found the rudimentary foot in the following states of development, taking only the large female specimens into account:—

(1) Foot very distinct on both legs of the genital segment and provided with a posterior and two anterior papillæ, as in the normal feet, the left foot without claws, the right one with a single but very distinct claw (one specimen with 22 pairs of pregenital legs). Bouvier (1900*c*) records an exactly similar case.

(2) Foot as above but without claws (several specimens).

(3) Foot distinct on one leg but obsolete and indistinguishable on the other leg (several specimens).

(4) Foot indistinguishable on both legs of the genital segment (a couple of specimens).

On re-examining the specimens from Estcourt described as *P. moseleyi* on p. 339 of my former paper, I succeeded in finding a rudimentary foot on the genital legs in one of the large females. These specimens were not well preserved, and the rudimentary foot had become pressed into the apex of the leg and so escaped notice until I scratched it free with a needle.

From the above it is evident that the presence or absence of a rudimentary foot on the legs of the genital segment cannot be utilised as a specific character. It may be as well to remark, however, that, in spite of the variation to which this foot is liable, I have never yet come across a specimen in which the genital legs possessed perfect two-clawed feet in either *P. moseleyi* or *capensis*, although a one-clawed leg may occasionally occur in each of these species.

In the beginning of April, 1899, I received from the Rev. J. R. Ward five large pregnant females of *P. moseleyi*, which he had captured during the previous month at Richmond, Natal. Mr. Ward suggested that these specimens should be kept alive for the purpose of ascertaining the relation of the number of legs and the colouration of the young to that of the mother. I accordingly isolated the specimens in glass jars provided with damp moss, and had the satisfaction of obtaining and examining a large number of young,

which were born during the month of April. Some of these lived several months in captivity, long enough at any rate to show that the differences in their colouration remained permanent during that time. The number of young to which each female gave birth, while in my possession, is not necessarily the total number of its brood for the year, as some were probably born before I received the specimens.* The results of the breeding were as follows :—

No. I.—Large ♀ with 22 pregenital claw-bearing legs, the sides and upper surface of the body almost entirely light brick-red, the upper lateral dark stripes not developed on either side (colouration type No. 1, p. 97). Gave birth to 7 young, viz. :—

2 with	22	pregenital	pairs of legs	Colour of body brick-red, upper lateral dark stripes distinct.
2 ,,	21	,,	,,	
1 ,,	22	,,	,,	Colour greenish black above, the lateral band above legs reddish.
1 ,,	21	,,	,,	
1 ,,	22	,,	,,	Colour of body black.

No. II.—Large ♀ with 22 pairs of pregenital legs, the sides and upper surface of body light brick-red, but the superior dark lateral stripes are distinct (colouration type No. 2, p. 97). Gave birth to 10 young, viz. :—

5 with	21	pregenital	pairs of legs	Colour of body light brick-red, the superior lateral dark stripes well marked.
1 ,,	22	,,	,,	
3 ,,	21	,,	,,	Colour of body brick-red at the sides along the lateral bands, but with much more black on the upper surface.
1 ,,	22	,,	,,	

No. III.—Large ♀ with 21 pairs of pregenital legs, the prevailing colour of the upper surface of the body dark green intermixed with some red, the light lateral bands above the legs on each side brick-red (colouration type No. 3, p. 97). Gave birth to 9 young, all with 21 pregenital pairs of legs, viz. :—

7 brick-red in colour with the superior lateral dark stripes distinct.

2 brick-red at the sides along the light lateral bands above the legs, but black intermingled with some red on the upper surface.

No. IV.—Large ♀ with 21 pairs of pregenital legs, colour of sides

* Mr. J. R. Ward has himself made various observations on the breeding, &c., of *P. moseleyi*, and these have in part been published in Jour. Quekett Micr. Club (2) vi., pp. 424–428, 1897, but I have not been able to see this paper. Mr. Ward informs me by letter that he found that the young followed the mother in the colouration of the body.

and upper surface of body black (colouration type No. 4, p. 97). Gave birth to 9 young, viz. :—

2 with	21	pregenital pairs of legs		Colour brick-red, the superior lateral dark stripes present.
3 ,,	20	,,	,,	Colour brick-red at the sides along the lateral bands, but with much black intermingled with some red on the dorsal surface.
2 ,,	21	,,	,,	
2 ,,	21	,,	,,	Colour black above, the light lateral bands above the legs pinkish.

No. V.—Large ♀ with 21 pairs of pregenital legs, the sides and upper surface of the body dark brownish olive-green (colouration type No. 4, p. 97). Gave birth to 6 young, viz. :—

1 with	21	pregenital pairs of legs		Colour of body brick-red, the superior lateral black stripes present.
1 ,,	22	,,	,,	
3 ,,	21	,,	,,	Colour reddish at the sides, but with much black above.
1 ,,	22	,,	,,	

From the above it appears that females with 21 pairs of pregenital legs may give birth to young with 20 and 21 or with 21 and 22 pairs, and further that the colour of the young may resemble that of the mother or be quite different from it. In each case, however, it will be noticed that the majority of the young had the same number of legs as the mother.

In a recent paper Bouvier (1900*c*) states that he found in the collections of the London and Hamburg Museums 9 specimens of *P. moseleyi*, viz., 1 ♂ with 22, 2 (1 ♂, 1 ♀) with 23, 5 (2 ♂, 3 ♀) with 24, and 1 ♂ with 25 pairs of legs (the rudimentary legs of the genital segment being included by Bouvier in the counting).

In the ♂ with 25 and the 3 ♀ with 24 pairs of legs the last (genital) pair was rudimentary and without claws, except in one ♀ in which the left stump was provided with a single claw. These four specimens are doubtless specifically identical with the four Pietermaritzburg specimens in the South African Museum having the same number of legs and formerly regarded by me as doubtfully new (1899, p. 339). In view of the extraordinary local variations in the number of the legs, which I have observed in other species (see *P. leonina*, p. 105), I have now no doubt that these forms with 23 to 24 pairs of pregenital legs are merely local varieties of *P. moseleyi*.

In the two males with 24 pairs of legs, mentioned by Bouvier, the legs of the last (genital) pair were very rudimentary and

reduced to an incomplete foot in one specimen, but consisted of a well-formed foot on a prominent stump with rudiments of a spinous pad in the other specimen. Of these two specimens Bouvier further says, "Les pattes posterieures étaient toutes deux armées de deux griffes" (p. 120), and from this I conclude that these specimens belong to a species of the *balfouri* section, in which the genital legs are always provided with normal claws, although the leg itself is frequently greatly reduced in the male, as in Bouvier's specimens. In any case Bouvier is hardly justified in identifying them with *P. moseleyi* merely because they appear similar to the latter species in other respects. *P. sedgwicki*, Purc., for instance, which possesses claw-bearing genital legs, much resembles *moseleyi* in size, shape of the papillæ, width of the middle spinous pad, and colouration, and possesses only one pair of pregenital legs less than some males of *moseleyi* have.

The principal specific characters of *P. moseleyi* may now be restated as follows: Number of pregenital legs 20–24 pairs, each bearing a pair of claws; the rudimentary leg on each side of the genital opening rarely quite obsolete, generally distinguishable and either without foot or with a rudimentary but clawless foot, sometimes with a single claw on one of the feet; papillæ of body not incrassated at apex. Inhabits Natal and the eastern portion of Cape Colony. Size large.

The list of specimens examined and their localities, mentioned in my previous paper, may be shortly recapitulated here together with some additional ones.

(*a*) Two specimens from the Katberg Forest with 21 pairs of pregenital legs (Purcell, 1899, p. 340).

(*b*) Three ♀ and 3 ♂ from Estcourt, Natal, all with 22 pairs of legs (p. 338).

(*c*) A number of living specimens from Richmond, Natal (*Rev. J. R. Ward*), from which a large number of young were obtained. Of 5 fairly large males two had 20 pairs, two 21 pairs, and one 22 pairs of legs, while of 7 large females five had 21 and two 22 pairs of legs. If we include all the young with the above, out of a total of 53 specimens from Richmond there were 5 with 20 pairs of legs, 37 with 21 pairs, and 11 with 22 pairs.

The specimens from this locality range through all the types of colouration described on p. 97, there being—

(1) *Brick-red forms*, with the smaller papillæ of the dorsal surface somewhat darkened with blackish pigment, but the larger ones of this surface and all the papillæ in the light lateral bands pure pale

brick-red, with at most a darker ring at the apex; the outer surface of the legs blue-black, redder proximately, the larger papillæ reddish; under surface of body and of legs pinkish, becoming pallid in spirits.

(2) *Brick-red forms with black lateral stripes;* colour as above, but with more black, giving rise to a distinct lateral stripe on each side just above the light lateral band.

(3) *Black (or dark green) forms with red sides;* colour of whole upper surface dark green or black, with numerous large brick-red papillæ evenly scattered about, giving the whole surface a brownish tinge; the light lateral band above the legs on each side bright brick-red, with scarcely any black pigment; outer surface of legs dark, with perhaps a few reddish papillæ; ventral surface of body pinkish when alive. This resembles the specimen figured by Sedgwick, 1888*b*, pl. 17, fig. 8.

(4) *Black or dark green forms;* colour of dorso-lateral surface a uniform dark brownish olive-green, an olive-greenish black, or an almost uniform black with a faint tinge of greenish in some lights; ventral surface pinkish; the lateral band above the legs on each side lighter in colour but not reddish; scattered reddish papillæ occur, but they are entirely, or almost entirely, confined to the sides, occurring especially in the light lateral bands and on the outer surface of the legs; or they may be quite absent and replaced by large pallid papillæ; these large reddish and pallid papillæ are often entirely absent from the dorsal surface proper and almost absent from the outer surface of the legs; the black medio-dorsal stripe is always distinct in these, as in all other specimens.

The young are born throughout the month of April, and probably also in March. When disturbed this species merely shortens itself like *capensis*, but does not coil up spirally like *balfouri* and *leonina*.

(*d*) Two large ♀ (alive), with 22 pairs of pregenital legs, from Aslockton, Dronkvlei, near the Umzimkulu River, Ixopo District, Natal, collected by Mr. E. Marriott and kindly forwarded by the Rev. J. R. Ward (Oct., 1899). Colour of upper surface of body greenish black (blacker when contracted, greener when extended), the usual paler lateral bands above the legs on each side more distinctly green or brownish; large reddish or whitish papillæ present on the sides in the one, almost absent in the other specimen; under side pinkish, with or without a few dark green papillæ along the median line; legs blue-black externally.

But the most striking feature of this beautiful variety is the creamy-white colour of the whole of the upper, under, and lateral surfaces of the head between the base of the antennæ and the first

pair of walking legs, excepting where the narrow medio-dorsal stripe traverses the upper surface. The anterior surface of the head from a line joining the ventral margins of the basal part of the blue-black antennæ to a line drawn just behind the eyes greenish black ; the slime appendages creamy white, without any dark pigment.

A live specimen measured, while extended and in the act of walking, 61 mm. long by 4 mm. broad, and while contracted (but not curved), only 36½ mm. by 5¾ mm.

This is one of the most beautiful forms I know of, the contrast between the creamy-white head and the velvety-black surface being very striking. I have seen only one other white-headed specimen, viz., one of *P. balfouri* from Newlands (described in 1899, p. 343).

(*e*) Three specimens from Pietermaritzburg with 23–24 pregenital legs (Purcell, 1899, p. 339). Sedgwick records a specimen with 22 pairs of legs from here.*

(*f*) A large ♀ from Riet Vlei in the west of the Umvoti District, Natal (alt. about 5,000 feet), found by Mr. Harold A. Fry. This specimen has 23 pairs of pregenital legs like the last and is remarkably pale in colour.

Specimens of *P. moseleyi* have also been recorded from "near King William's Town, Cape Colony" (Sedgwick, 1888*b*).

4. *Peripatopsis balfouri* (Sedgw.).

Amongst a large number of specimens from Simons Town with 18 pairs of claw-bearing legs, two medium-sized males with 19 pairs were found. This is the first instance of such variation recorded for this species. Both were captured by myself at a spot where the normal form was fairly plentiful, and they resembled these in every other respect.

Further, amongst 31 specimens (12 ♂, 19 ♀) which I collected at a spot below Platteklip on the side of Table Mountain were 2 ♂ with 19, and 1 ♀ with 16 pairs of legs, all the rest having 18 pairs. The genital legs were provided with the normal pairs of claws in every case.

5. *Peripatopsis leonina*, Purc.

The specimens of *leonina* originally described by me were all captured in two small valleys cutting into the south-east slopes of that part of Lions Hill known as the "Saddle," *i.e.*, the lower portion

* Proc. Phil. Soc., Cambridge, vii., pp. 250–251.

lying between Lions Head and Lions Rump. These, as well as a number of specimens captured in subsequent years in the same valleys, all possessed either 21 or 22 pairs of legs.

Recently we obtained 42 other specimens of this species from another valley, situated on the same side of the hill, but much nearer Table Bay, and east of the signal station on the highest point on Lions Rump. These specimens comprise 14 ♂ and 2 ♀ with 22 pairs, 13 ♂ and 11 ♀ with 23 pairs, and 2 ♂ with 24 pairs of claw-bearing legs, but do not differ otherwise from those from other parts of the hill. This valley is only a little more than half a mile distant from the nearest valley in which the specimens with 21 to 22 pairs of legs occur, and closely resembles it in most respects, facing as it does nearly the same direction; hence the extraordinary variation in the number of the legs in the specimens found in each is all the more remarkable.

Possibly Sedgwick's specimen with 20 pairs of legs (1888*b*, p. 169) is also a local variety of *leonina*.

It is interesting to note that *Peripatopsis* in the Cape Peninsula may, therefore, possess any number of pairs of claw-bearing legs from 16 to 24 inclusive.

6. *Opisthopatus cinctipes*, Purc.

The specimens at my disposal were the following:—

(*a*) 15 ♀, 3 ♂, and 4 very young specimens from Dunbrody, Uitenhage Div., Cape Colony, kindly collected for us and preserved in spirits by the Rev. J. A. O'Neill. Some of these which I sectioned were in an excellent state of preservation.

In colour these specimens vary much after the manner of the species of *Peripatopsis*. The dark, almost black, medio-dorsal stripe is always very distinct, and is divided longitudinally by a fine white line, visible only in places in the preserved specimens. The lower of the two dark green or blackish lateral stripes, described in *P. balfouri* (An. S. Af. Mus., i., p. 342), connecting the bases of the legs is also present, at least in the reddish specimens, but the upper dark lateral stripe on each side, although often indicated, is not distinct. The usual lighter lateral band on each side just above the bases of the legs is always very distinct, and is almost or entirely devoid of dark green pigment in the reddish specimens. The alternating bands on the ventral surfaces of the legs are not always well marked, the papillæ being often either all entirely pallid or all green.

All the principal types of colouration described on p. 97 occur amongst these specimens, viz :—

(1) *Reddish specimens.*—The prevailing colour of the dorsal and lateral surfaces of the body (including most of the papillæ) is a light brick-red (terra-cotta), with a small and varying amount of dark green scattered about between the papillæ, especially towards the posterior part of the body. A varying number of small papillæ are also dark green and these are mostly distributed about midway between the medio-dorsal line and the legs in the region corresponding to the upper dark lateral stripes in *P. balfouri*, &c., giving rise here to a similar but rather indistinct stripe. The lateral band just above the bases of the legs is pure light brick-red, without any green whatever. On the *dorsal* surface of the legs transverse bands of large brick-red papillæ alternate with bands of smaller dark green papillæ.

(2) *Dark greenish specimens with red sides.*—In these most of the smaller papillæ on the upper and on part of the lateral surfaces and a large amount of the surface between the papillæ are dark green, excepting quite anteriorly, so that the back appears dark greenish with a reddish tinge owing to the presence of numerous large brick-red papillæ. The lateral bands are light brick-red with a small amount of dark green, and the legs possess alternating bands of dark green and brick-red papillæ on their outer surfaces.

(3) *Dark green specimens*, like the original types.—Prevailing colour dark green, the reddish pigment of the upper and lateral surfaces being confined to a smaller number of large papillæ (resembling *P. balfouri*, *leonina*, and *clavigera* in this respect); these papillæ occur also in the paler green lateral band above the bases of the legs on each side, while on the outer surfaces of the legs they may be fairly plentiful or almost entirely absent and do not form the distinct alternating bands found in the reddish specimens.

(*b*) A ♀ from Doornnek in the Zuurberg Range, Alexandria Div. (*J. L. Drège*).

(*c*) Six ♀, two ♂ and several newly-born young, all living, besides several dead specimens, from Richmond, Natal,* collected by Mr.

* After this paper had gone to the printers, a paper by Bouvier came to hand, entitled "Quelques observationes sur les Onychophores (Peripatus) de la collection du Musée Britanique" (Q.J.M.S. (2) xliii. pt. 2, pp. 367–373, 1900) dealing, amongst others, with *O. cinctipes*, *P. moseleyi* and *P. sedgwicki*. I shall only mention here that Bouvier records specimens of *O. cinctipes* from Durban, Natal, in which he observed the cruciform sexual opening and the large coxal organs (on the 6th to 16th pairs of legs inclusive). On this account, as

W. Clark, a farmer in the district. Mr. J. R. Ward, who forwarded the specimens to us, writes that they were found about four miles east of Richmond "under stones fallen from the sides of a little gorge, down which a very small stream trickles in dry weather and runs in wet weather." There was no timber in the gorge, which descends very rapidly to the small river Illovo. It is interesting to note that some young were born in the latter half of September,* and that the specimens were found at a very dry time of the year. Mr. Ward informs me that the rainfall at Richmond during the three previous months (June, July, and August, 1899) was respectively ·17, ·11, and ·29 inches.

These specimens were in excellent condition and were the first I had an opportunity of examining alive. They entirely agree in structure with the specimens from Dunbrody, and their unexpected appearance in Natal indicates a wider range for this species than is at present known for any other South African forms.

The colouration in the living specimens resembles that of the darker specimens from Dunbrody, except that the ground colour of the under surface is brownish pink, while that of the upper surface is blackish rather than green. In some of the specimens the skin between the papillæ on the head is conspicuously orange-yellow (not brick-red). The alternating bands on the under side of the legs are indistinct, but the superior lateral dark stripes on the body are present as in *P. balfouri*. After being some time in spirits, the pink of the under surface disappears, and the black of the dorso-lateral surfaces often become distinctly greenish. Such specimens then resemble the spirit specimens from Dunbrody.

When the live animal is disturbed it coils itself up like *P. balfouri* and *leonina* with the ventral surface inwards, and will remain in this position for some time, especially if further molested (one remained thus for over five minutes). When coiled up the dorsal skin is often strongly constricted at regular intervals, which alternate in position with the pairs of legs and give the animals an annulated appearance. This is also the case in *P. balfouri* and *leonina*.

The males were much smaller and less numerous than the females in both collections. The length and width of a male in spirits and somewhat contracted (from Dunbrody) was 13 mm. × 2·2 mm.; of a male from Richmond, drowned in water and therefore abnormally

well as on account of the blackish-grey colour and the more regular arrangement of the rows of papillæ, he makes a new *var. natalensis* for these Natal specimens. This variety, as based on Bouvier's characters, does not, however, hold good.

* The young of *P. moscleyi* from Richmond are born in April.

enlarged, 22·5 mm. × 2·5 mm.; and of a large female from Dunbrody (in spirits and moderately extended), 25 mm. × 3·5 mm.

7. *Diagnosis of the African Genera.*

This paper may be concluded with an amended diagnosis of the two South African genera, and a revised synoptic table of the species embodying the foregoing observations. For the sake of completeness, *Peripatus tholloni*, Bouv., is included. Essential generic characters, as distinguished from those which appear of secondary importance, are printed in italics; it is not, however, attempted to give a complete list of all the differences between the genera, and we are, moreover, insufficiently acquainted with the ova and the development of *O. cinctipes* and *P. tholloni*.

I. *Peripatopis.—Genital opening mostly subterminal, the leg on each side of it more or less rudimentary or at least much reduced in size and much smaller than the legs of the first pair, with or without a foot and occasionally even absent. No legs posterior to the genital segment. No well-developed coxal organs present. Genital organs in* ♀ *simple, without receptacula. Ductus ejaculatorius in the* ♂ *provided with a pair of accessory glands opening into its posterior end; no other accessory glands in the genital or postgenital segments, but in the pregenital segment the crural glands are enormously enlarged and discharge externally by an opening situated on a large non-retractile papilla on the ventral surface of the leg.** *Spermatophors minute, oval.* Legs with 3 spinous pads, those of the 4th and 5th pair with the nephridial opening situated in the proximal pad; feet with one posterior and two anterior papillæ; legs of the genital segment not used for walking; small crural glands may occur on most of the other legs in both sexes. Genital opening in the ♀ longitudinal; the embryos in the uterus all of nearly the same stage, except at one season of the year (March, April, May), when two broods overlap. Outer jaw with small accessory tooth at base of main tooth; inner jaw with no interval between the large tooth and the series of smaller ones. South African.

II. *Opisthopatus.—Genital opening between the posterior pair of legs, which are well-developed and subequal in size to the legs of the first pair. No legs posterior to the genital segment. Most of the legs with a well-developed coxal organ. Genital organs in the* ♀ *with simplified receptacula seminis but no receptacula ovorum. Ductus ejaculatorius in the* ♂ *without accessory glands, but the genital and a*

* The ♂ of *P. clavigera*, Purc., is not yet known.

postgenital segment are each provided with a pair of accessory glands, which open externally by means of 4 separate openings on the ventral surface of the body. Several pairs of the legs in the middle of the body provided in the male with enlarged crural glands, which open at the apex of a large retractile papilla on the ventral surface. Spermatophor large, elongate. Feet with a posterior, a superior, and an anterior papilla. Legs of the genital segment used for walking. Small crural glands not known to occur. Genital opening of ♀ formed mainly of a large transverse orifice; embryos in the uterus in very different stages of development. Spinous pads of legs and the jaws as in *Peripatopsis*. South African.

III. *Peripatus.—Genital opening situated between the legs of the penultimate pair, which are well developed. A postgenital pair of legs provided with nephridia is also present. Most of the legs with a well-developed coxal organ. Genital organs of ♀ complex, with complicated receptacula seminis and ovorum.** [*In the few males which have been examined there are no accessory glands in the genital segment, but a pair is present behind opening on each side of the anus, while crural glands opening on large (retractile ?) papillæ occur on one or more pairs of the legs immediately preceding the genital segment, one or two such papillæ occurring on each of these legs. The spermatophor is large and elongate.*] Legs with 3 to 5 spinous pads, those of the 4th and 5th pair with the nephridial opening in the 3rd, or between the 3rd and the 4th pads (Bouvier). Feet with 1 to 2 posterior and 2 (in *P. sumatranus* only 1) anterior papillæ (Bouvier). Embroys in the uterus in very different stages of development. Outer jaw with small accessory tooth or teeth at base of main tooth; inner jaw with the series of smaller teeth separated by an interval from the group formed by the large main tooth and the small tooth or teeth immediately next to it. American, African, and possibly East Indian.

8. *Synopsis of the known African forms.*

A. Genital opening between last pair of legs, which are, however, sometimes obsolete.

A¹. Legs without distinct coxal organs. (Feet with 1 posterior and 2 anterior distal papillæ) .. .. Gen. PERIPATOPSIS.

a. Legs of the genital segment without paired claws (occasionally with 1 claw).

* Bouvier mentions the occurrence of receptacula seminis in *P. tholloni*, but says nothing of receptacula ovorum.

a^1. 17–18 pairs of claw-bearing pregenital legs. South-western part of Cape Colony (Cape, Paarl, Caledon, and Swellendam Divs.)
P. capensis (Grube, Sedgw.).

b^1. 20 to 24 pairs of pregenital legs. Natal (Estcourt, Pietermaritzburg, Riet Vlei, Richmond, Dronkvlei and south-eastern part of Cape Colony (K. Will. Town, Katberg.) *P. moseleyi* (Wood-M.).

Legs of the genital segment with normal feet and paired claws.

a^2. None of the papillæ of the dorso-lateral surfaces incrassated apically.

a^3. Size large; middle pad of legs narrower, 1·5 to 2·2 times as wide as the proximal pad; large papillæ of body more conical (fig. 10). 20 pairs of claw-bearing legs. Knysna, Albany
P. sedgwicki, Purc.

b^3. Size smaller; middle pad broad, 2 to 3 times as wide as the proximal pad; large papillæ of body more cylindrical (fig. 9).

a^4. 18 (rarely 19) pairs of claw-bearing legs. Cape and Clanwilliam Divs. .. .. *P. balfouri* (Sedgw.).

b^4. 21–24 pairs of claw-bearing legs. Lions Hill (Cape Town)
P. leonina, Purc.

b^2. Many of the papillæ of the dorso-lateral surfaces of the body incrassated apically. 17 pairs of claw-bearing legs. Knysna
P. clavigera, Purc.

B^1. Legs with large well-developed coxal organs. (Feet with 1 posterior, 1 superior, and 1 anterior distal papilla) .. .. Gen. OPISTHOPATUS.

16 pairs of claw-bearing legs. Natal (Richmond) and south-eastern part of Cape Colony (Uitenhage and Alexandria Divs.) .. *O. cinctipes*, Purc.

B. Genital opening between the penultimate pair of legs .. Gen. PERIPATUS.

22–25 pairs of legs. Equatorial West Africa (Gabon) .. *P. tholloni*, Bouv.

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EXPLANATION OF THE PLATES.

ant, anterior part of figure.
post, posterior ,, ,,
prox, proximal ,, ,,
dist, distal ,, ,,
Muscles are coloured yellow.

All figures, excepting figs. 8–10, 15, 18–20, and the diagrams (figs. 1–5, 24), were drawn by means of Winkel's drawing apparatus.)

Plate X.

Figs. 1–5. Diagrams of various Onychophora, showing the pregenital, genital, and postgenital segments of the ♂ from the ventral surface. The genital opening is represented as a cruciform opening in all. *ac. g*, accessory glands of postgenital segments. cr^1, openings of the crural glands of the pregenital segment. cr^2, openings of the crural (accessory) glands of genital segment. *cx*, coxal organs. n^1, nephridial opening on pregenital segment. n^2, nephridial opening on postgenital segment.

Fig. 6. Inner jaw of *O. cinctipes* from Richmond. 6a, outer jaw of same specimen.

Fig. 7. Genital opening of ♀ and ♂ of *O. cinctipes* (spirit specimens from Dunbrody); the arrow indicates the median line and the anterior direction.

Fig. 8. Papillæ of *O. cinctipes;* the 3 large papillæ from legs (a) and from sides of body (b, c) of drowned specimen; the small papilla, d, from a spirit specimen.

Fig. 9. Outline of large papilla from sides of body of *P. balfouri*.

Fig. 10. Outline of large papilla from sides of body of *P. capensis*.

Fig. 11. Ventral view of posterior end of a ♂ of *O. cinctipes* from Richmond (drowned); the papillæ are carefully drawn in their natural positions. $ac. g^1$, papilla bearing the external opening of anterior accessory gland. $ac. g^2$, papilla bearing the external opening of posterior accessory gland. *an*, anus. *cx*, coxal organ. *g. p*, one of the 4 papillæ round the genital opening. *n*, nephridial opening.

Fig. 12. The 3 spinous pads of 5th right leg of *O. cinctipes* (♀ from Dunbrody, in spirits). *n*, opening of the nephridium.

Fig. 13. The coxal organ on 8th left leg of large ♀ *O. cinctipes* from Dunbrody, showing the organ as it often appears in spirit specimens. *cx*, the evaginated peripheral portion of the epithelium with smooth cuticula; cx^1, invaginated central portion of this epithelium; *ep*, ordinary, echinate, papilliferous epithelium of the surrounding skin.

Fig. 14. 12th right leg of ♂ *O. cinctipes* from Richmond, ventral view (drowned specimen). *cx*, fully expanded coxal organ, forming a bulging convexity. *r.f*, ring-shaped fold enclosing the papilla at the apex of which the crural gland

opens. 14a. End view of the foot, showing the arrangement of the three papillæ. (Figs. 11 and 14 were drawn from the same specimen.)

Plate XI.

Fig. 15. Sketch of the male sexual organs, accessory glands, and posterior crural glands of *O. cinctipes* (from a dissected, freshly drowned specimen from Richmond, enlarged about twelve times). ix–xvi, ninth to sixteenth segments, showing the bases of the legs (*leg*), and in the 9th to 13th the internal parts of the crural glands (*cr*) also. *nv*, the two nerve cords, showing scarcely any segmental thickenings. *te*, testis. *s. v*, seminal vesicle. *v. d*, paired portion of vas deferens. V. D, unpaired portion of vas deferens, forming a loop (cut in section in fig. 28). *d. ej*, ductus ejaculatorius. *r. ac.* g^1, right anterior accessory gland. *r. ac.* g^2, efferent duct of right posterior accessory gland; *r. v*, carrot-shaped vesicle of this gland; *r. c*, central portion of the gland, round which the end of the anterior accessory gland is coiled; *ap*, terminal appendage of the posterior gland.

Fig. 16. Middle portion of a posterior accessory gland of the same specimen, enlarged sixty times to show the course of the anterior gland (*ac.* g^1) over its surface; the latter gland is shaded where visible, but indicated by dotted lines where hidden from view, and ends blindly at *x*. *v*, vesicle, and *ap*, terminal appendage of posterior gland.

Fig. 17. Ovary, receptacula seminis (*r. s*), and the ovarial ends of the oviducts of *O. cinctipes* (from a freshly drowned ♀ from Richmond), showing the ova (*ov*) in follicles. *in*, thick wall of infundibular part of oviduct. *od*, thinner wall of the oviduct. *per*, outer coat of oviduct (peritoneum and muscles).

Fig. 18. Two embryos from the dissected type specimen of *P. sedgwicki*, Purc.; *a*, large embryo nearest the external opening; *b*, the smallest embryo of the same brood.

Fig. 19. Two embryos from the dissected type specimen of *O. cinctipes; a*, large embryo nearest the external opening; *b*, the smallest embryo of the series.

Fig. 20. Female genital organs of *O. cinctipes* (from a freshly drowned dissected specimen from Richmond). *ov*, ovary. *r. s*, receptaculum seminis. *g*, external genital opening. *od*, oviduct.

Plate XII.

Fig. 21. Section through the external opening of the crural gland in the 11th right leg of a ♂ *O. cinctipes* (alcoholic specimen from Dunbrody, cut transversely to body; Zeiss, $\frac{1}{12}$ Immers. Oc. ii.). *cr*, part of the duct of the crural gland; nearer the opening the lumen is cut. *p*, large papilla, bearing the opening of the crural gland and withdrawn into a cavity, the wall (*r. f*) of which forms the ring-fold when the papilla is protruded. *cx*, portion of the coxal organ, passing over at *x* into the echinate ectoderm of the ring-fold. *b. c*, blood corpuscles.

Fig. 22. Section through an expanded coxal organ of *O. cinctipes* (9th left leg of a spirit specimen, a ♀ from Dunbrody, cut transversely to axis of leg, Zeiss, $\frac{1}{12}$ Immers. Oc. ii.). *x, x*, boundary between smooth and echinate cuticula. *b. c*, blood corpuscles. *cx*, striated epithelium of coxal organ.

Fig. 23. Section through an invaginated coxal organ of the same specimen (8th right leg cut transversely to the axis of the leg). *cx. o*, slit-like external opening of the cavity formed by the invagination of the coxal organ, which is represented by the epithelium with smooth cuticula (*cx*).

Fig. 24. Diagram showing approximately the arrangement of the accessory glands in the specimen of which fig. 25 is a section through the region indicated.

by the dotted line. *r. ac. g*^{1}, *l. ac. g*^{1}, right and left anterior accessory glands. *r. ac. g*^{2}, *l. ac. g*^{2}, right and left posterior accessory glands.

Fig. 25. Transverse section through a ♂ *O. cinctipes* in the region of the 14th pair of legs (alc. spec. from Dunbrody). A portion of the dorsal surface had been cut off for facilitating the embedding process, but the rest of the section is accurately drawn in, without diagrammatising.

b. c, blood corpuscles.
cx, coxal organs (the bracketed lines show the exact extent of the smooth cuticula of each organ).
d. ej, ductus ejaculatorius, cut through its anterior glandular part.
dvs, dorso-ventral muscular septum, dividing the mesial from the lateral sinus.
dvs^1, dorso-ventral muscular septum, separating the leg cavity from the nerve cord.
f. b, fat body.
h, heart.
l. ac. g^1, left anterior accessory gland, containing coagulated secretion.
l. c, central portion of left posterior accessory gland.
l. v, vesicular portion of left posterior accessory gland, containing coagulated secretion.
n, parts of the nephridium.
n. o, external opening of the nephridium.
n. v, nerve cord.
pg. ep, pigmented epithelium of dorso-lateral surfaces.
r, rectum.
r. ac. g^1, right anterior accessory gland, containing coagulated secretion.
r. c, central portion of right posterior accessory gland.
r. v, vesicular portion of right posterior accessory gland, containing coagulated secretion.
r. v. d^1 and *r. v. d*^{2}, left and right portions of the posterior loop of the right vas deferens (the line *x*.....*y* in fig. 15 indicates the places where the loop is cut).
sp^1, *sp*^{2}, *sp*^{3}, distal, middle, and proximal spinous pads.
v. o, ventral organ.

Fig. 26. Section through the 13th left leg of the same specimen (combined from several sections to show the portion of the crural gland which is situated in the cavity of the leg. *r. f*, fully expanded ring-fold, surrounding the papilla, *p*, at the apex of which the duct, *d*, of the crural gland, *cr*, opens. Other letters as in fig. 25. At *cr* the crural gland bends sharply, and is continued in an anterior direction for a considerable distance.

Fig. 27. Cross-sections through posterior part of ductus ejaculatorius (from the same series of sections as fig. 25). *a* is more posterior than *b*, and *b* more posterior than the section, *d. ej*, in fig. 25.

Fig. 28. Cross-section through the loop of the unpaired part of the vas deferens, cutting the loop along the line indicated in fig. 15. *a*, the wider, *b*, the narrower arm of the loop (from same series of sections as fig. 25). *sper*, spermatophor contained in the vas deferens.

Fig. 29. Cross-section through the terminal appendage of the posterior accessory gland (from the same series of sections as fig. 25).

Fig. 30. Cross-section through the efferent duct of the posterior accessory gland (from same series of sections as fig. 25).

Fig. 31. Another cross-section through the same duct, but more highly magnified to show the peculiar lumen ; *m*, muscular layer.

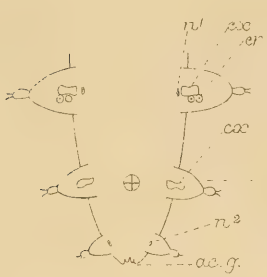


Fig.1. *Peripatus.*

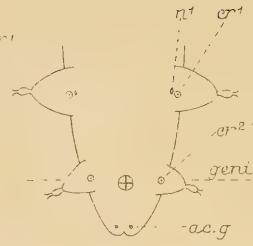


Fig.2. *Peripatoides leuckarti.*

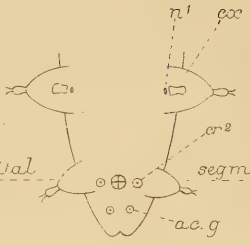


Fig3. *Opisthopatus cinctipes.*

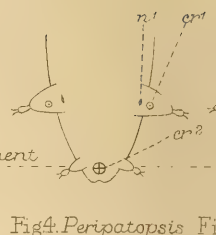


Fig4. *Peripatopsis balfouri.*

Fig.7 (×60)

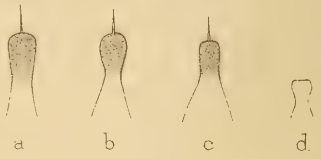
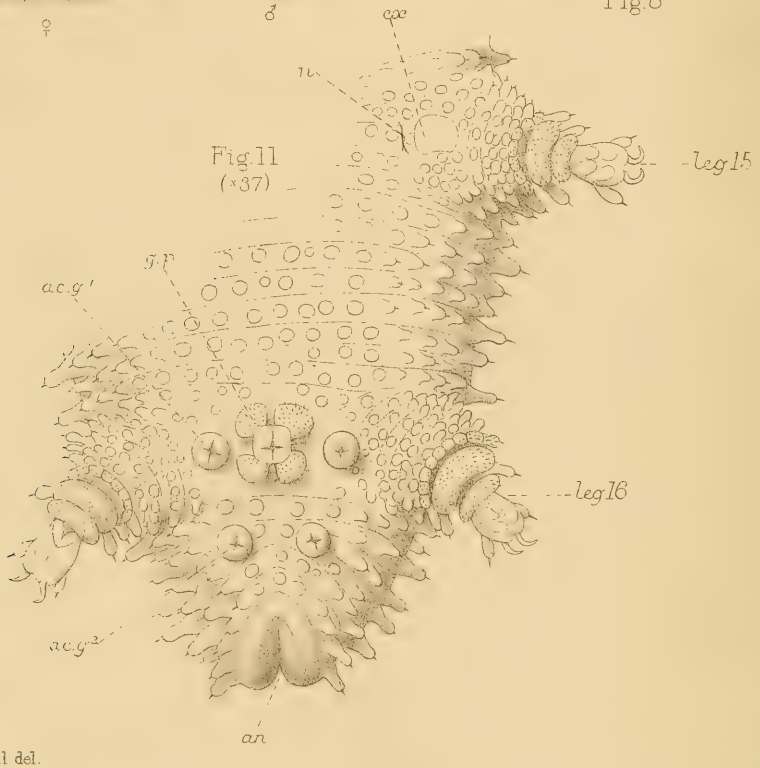


Fig.8

Fig.11 (×37)



W.F.Purcell del.

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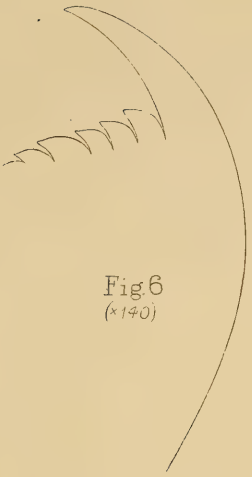


Fig.6
(×140)

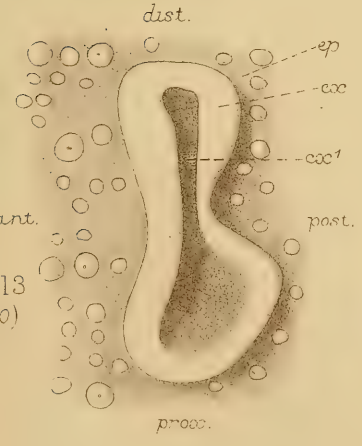
Fig.6 a.
(×140)

Fig.9

Fig.10

Fig.12
(×60)

Fig.14 a.



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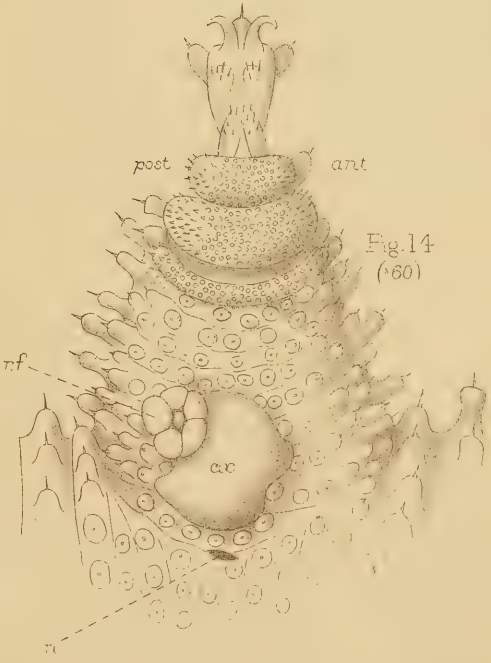


Fig.14
(×60)

West, Newman, lith

atus cinctipes.

Fig2. *Peripatoides* Fig3. *Opisthopatus* Fig4. *Peripatopsis balfouri.* Fig5. *Peripatopsis capensis*

Anatomy of Opisthopatus cinctipes

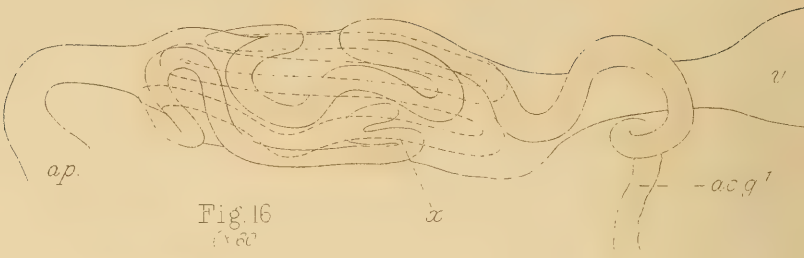
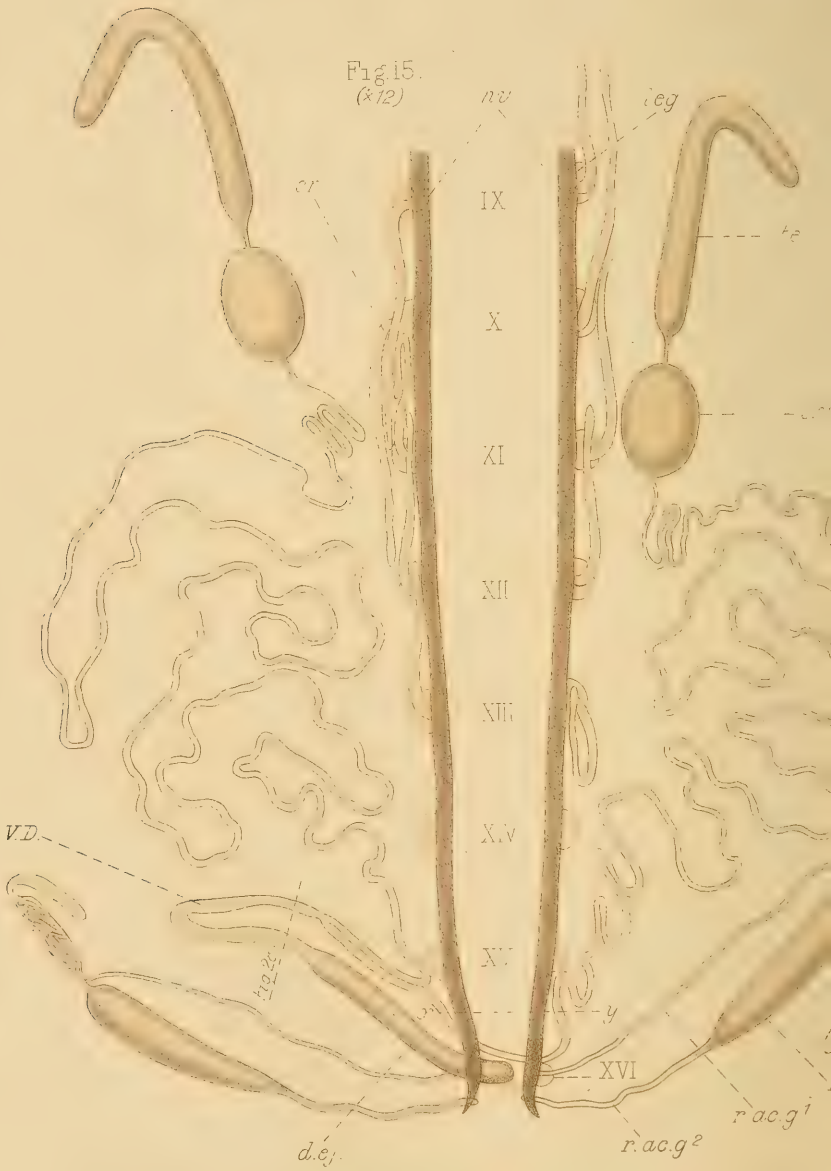


Fig. 16
(x 20)

Fig. 15.
(x 12)



W.F.Purcell del.

Fig 17.
(×60)

Fig 18.
(×4)

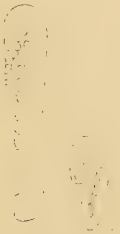


Fig 19.
(×4)

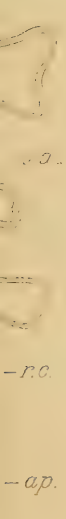


Fig 20
(×4)

West, Newman lith.

tus cinctipes.

Fig. 21
(×410)

Fig. 25.
(×70)

W.F. Purcell del.

Fig. 22
(×410)

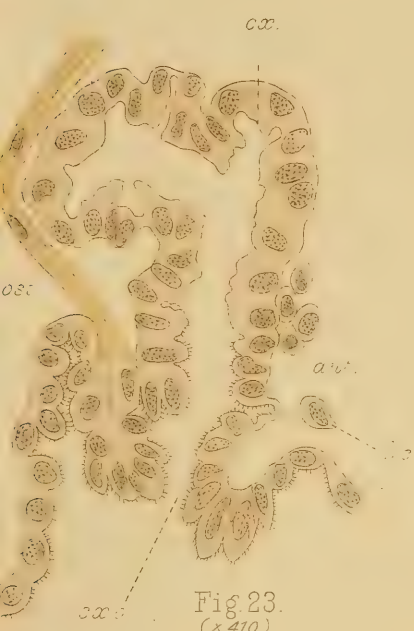


Fig. 23.
(×410)

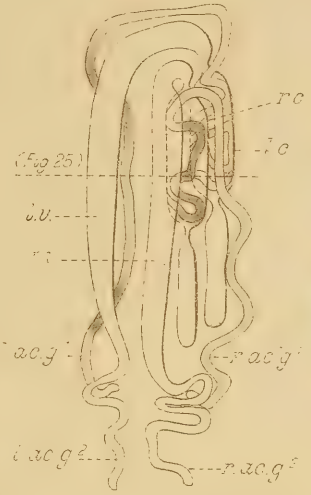


Fig. 24
(×24)

Fig. 27.
(×70)

Fig. 28
(×70)

Fig. 26.
(×70)

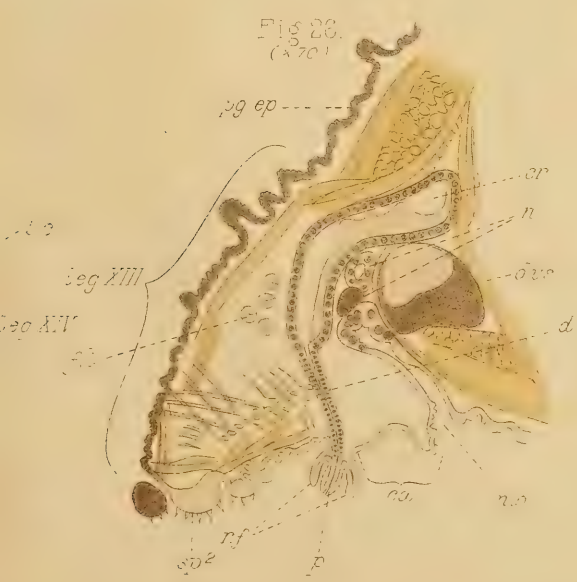


Fig. 29.
(×70)

Fig. 30.
(×70)

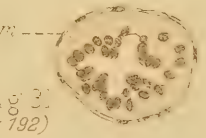


Fig. 31.
(×192)

alus cinctipes

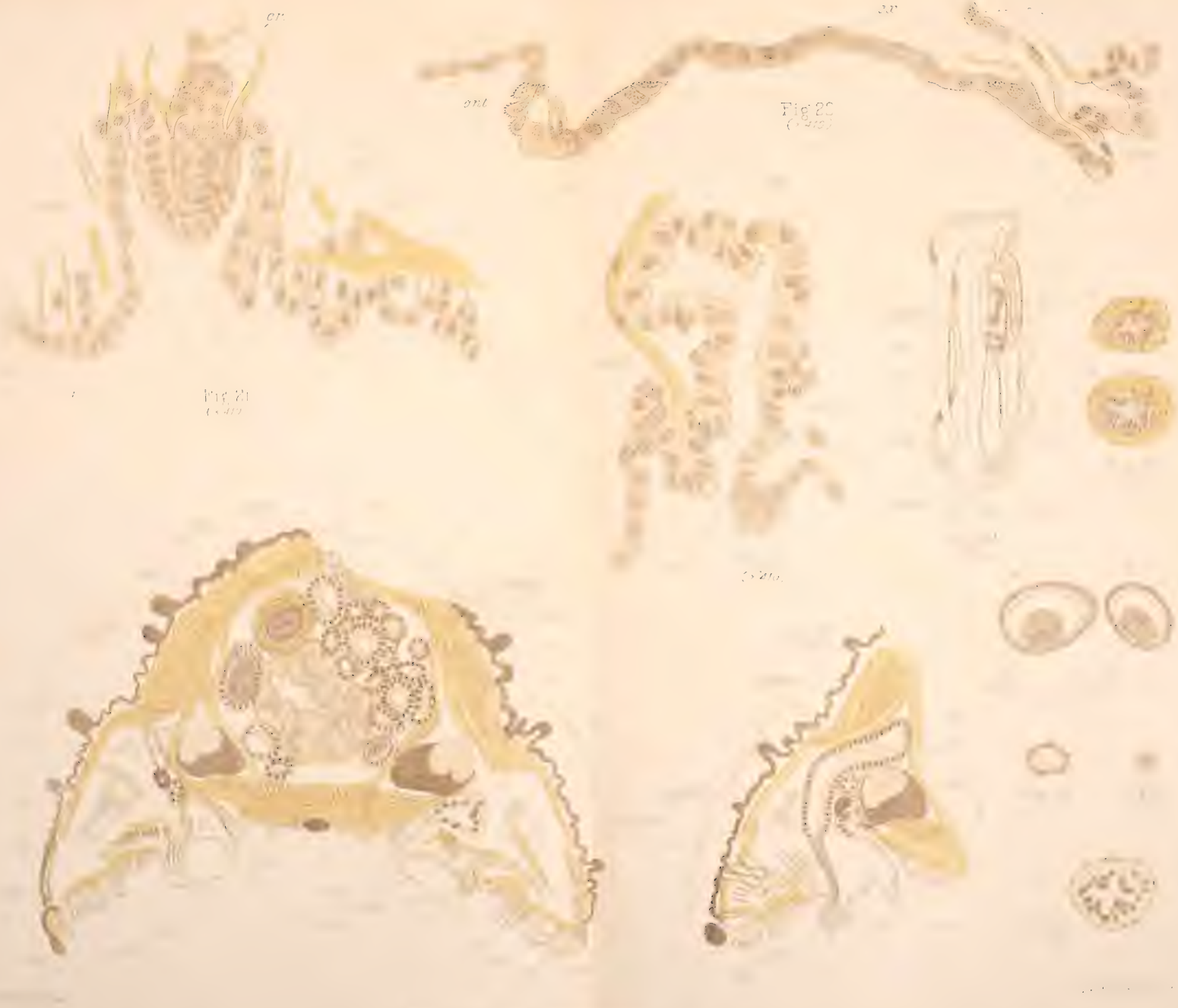

gr
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Fig. 20.
Fig. 21.

VI.—*Description of New Species of South African Pselaphidæ.*—By Achille Raffray.

Tribe EUPLECTINI.

Gen. CHÆTORHOPALUS, Raffr.,

Rev. d'Ent., 1887, p. 49; ibid., 1890, pp. 102, 104; ibid., 1893, pp. 208, 229.

Oblongo-ovatus, Caput subtriangulare, æquale, infra utrinque oris lateribus leviter productis, oculi magni, postice siti, Antennæ mediocres, articulis penultimis leviter latioribus, clava attamen articulo ultimo magno tantummodo constanti. Prothorax subovatus, æqualis. Elytra magna, antice posticeque attenuata, stria suturali integra, sulco dorsali valde abbreviato. Abdomen elytris brevius, segmento primo dorsali et secundo ventrali majoribus, 7mo ventrali (in mare) operculo magno, oblongo prædito. Prosternum haud carinatum, metasternum convexum. Tarsi magni, ungue unico et seta unguiculiformi.

Chætorhopalus minutus, nov. spec.

Totus rufus, nitidus, lævigatus. Caput antice valde attenuatum et truncatum, in fronte sulco transverso vix perspicuo. Antennarum articulis 1–2 multo majoribus, 3–8 minutis, moniliformibus, 9–10 paulo majoribus, crescentibus, transversis, 11 maximo, ovato, acuminato. Prothorax capite major, ovato-cordatus. Elytra prothorace longiora et paulo latiora, lateribus leviter rotundata, sulco dorsali multo ante medium abbreviato. Abdomen elytris paulo brevius et angustius. Metasternum delicatule sulcatum. Long. 0·80 mm.

This species differs from *unicolor*, Raffr., from Zanzibar, by its larger size, and the tenth joint of the antennæ, which is more transverse, the eleventh larger, and the prothorax which is a little shorter.

Southern Rhodesia (Salisbury).

Gen. PERIPLECTUS, Raffr.,
Rev. d'Ent., 1887, p. 85; ibid., 1893, p. 244.

Parum elongatus. Caput trapezoidale, supra inæquale. Oculi postice siti, magni. Antennæ breves, clava biarticulata. Prothorax breviter cordatus, sulco transverso et foveis lateralibus tantummodo insculptus. Elytra magna, humeris dentata, sulco susepipleuro prædita, basi trifoveata, sulco dorsali brevi. Abdominis segmentis dorsalibus æqualibus, ventralibus 2 paulo majori, 7 (in mare) triangulari, operculo orbiculato vel ovali. Coxis intermediis et posticis approximatis. Tarsis brevibus, ungue unico.

This genus comes close to the genus *Trimiodytes*, Raffr., but differs by the much shorter shape of the body, and the club of the antennæ which is only bi-articulate.

Periplectus bicolor, nov. spec.

Castaneus, elytris piceis, antennis pedibusque rufis, breviter, parce, griseo-pubescens. Caput latitudine æquilongum, antice leviter attenuatum, lateribus obliquis, fronte longitudinaliter medio-impressum in linea oculorum anteriori foveis duabus magnis, postice juxta collum sulco longitudinali usque ad foveas extenso, infra sulcatum et utrinque gibbosum. Antennæ breves, articulis duobus primis majoribus, 3–7 minutis, moniliformibus, 8–9 paulo majoribus, subtransversis, 10 majori, transverso, 11 magno, breviter ovato, acuminato. Prothorax leviter transversus, lateribus rotundatus, postice leviter attenuatus, sulco transverso valido, medio angulato, utrinque fovea laterali magna. Elytra prothorace fere duplo longiora, lateribus leviter rotundata, subæqualiter antice posticeque attenuata, humeris obliquis, dentatis. Abdomen elytris paulo brevius. Metasternum convexum. Segmento ventrali 7 (in mare) rhomboidali, operculo ovato. Long. 0·80 mm.

This species differs from *nigripennis*, Raffr., from Zanzibar, by the seventh, eighth, and ninth joints of the antennæ being larger, and by the different sculpture of the head, and also by the longer elytra.

Southern Rhodesia (Salisbury).

Gen. TRIMIODYTES, Raffr.,
Trans. S. Afric. Philos. Soc., vol. x., 1897, p. 52.

Trimiodytes sulcifrons, nov. spec.

Elongatus, angustatus, rufus, nitidus, setis aliquot longis et dispersis. Caput postice convexum et rotundatum, antrorsum leviter attenuatum, fronte transversim late et profunde excavato, in medio caveæ tuberculato, utrinque supra antennas leviter nodoso, vertice medio inter oculos impressione magna, transversa, geminata medio carinula divisa. Antennæ mediocres, articulis duobus primis majoribus, 3–9 moniliformibus et longitudine decrescentibus, 10 transverso, paulo latiori, 11 magno, ovato, acuminato. Prothorax elongato-cordatus, postice leviter bisinuatus, sulco transverso medio angulato et utrinque fovea laterali magna. Elytra latitudine sua multo longiora, lateribus pone humeros obliquos et notatos leviter sinuata, pone medium leviter rotundata, sulco dorsali basi lato, brevi. Abdomen elytris æquilongum et nonnihil angustius, segmentis dorsalibus æqualibus, primo basi quadratim impresso. Metasternum simplex. Long. 1·10 mm.

This species differs from the others in the peculiar sculpture of the head and in the shape of the body which is more elongate and narrower.

Cape Colony (Stellenbosch).

Gen. BIBLOPLECTUS, Reitter,
Verh. Zool. Bot. Ges. Wien, 1881, p. 529; Raffr., Rev. d'Ent., 1893, p. 257.

Plus minusve elongatum, subparallelum et deplanatum. Caput trapezoidale. Oculi ad medium siti. Antennæ mediocres, clava plus minusve triarticulata. Prothorax plus minusve orbicularis vel quadratus cum angulis omnibus rotundatis, foveis tribus sulco transverso junctis. Elytra basi trifoveata, absque stria dorsali, lateribus recta, humeris quadrata. Segmentis dorsalibus æqualibus, ventralibus 2, 3, 4, æqualibus, 5 brevissimo, 6 quarto æquali, 7 (in mare) magno triangulari, apice acuminato, operculo elongato et angusto prædito, tarsi mediocres, ungue unico.

This genus much resembles *Asymoplectus*, Raffr., from which it differs in the proportions of the dorsal and ventral segments of the abdomen and the conformation of the seventh in the male. It occurs in nearly every part of the world.

Bibloplectus angustulus, nov. spec.

Elongatus, angustus, parallelus, brunneus, abdomine obscuriori, antennis pedibusque pallide testaceis, breviter et parce griseo-pubescens. Caput mediocre, longitudine et latitudine æquale, antrorsum valde attenuatum, lateribus obliquis, inter oculos foveis duabus magnis, juxta collum medio breviter sulcatum. Antennæ graciles, articulis 1, 2 multo majoribus, ovatis, 3–8 minutis, moniliformibus, 9 præcedenti paulo majori, 11 ovato, acuminato, decimo vix latiori. Prothorax capite haud latior, latitudine sua paulo longior, postice leviter attenuatus. Elytra latitudine sua multo longiora. Abdomen elytris longitudine vix æquale. Long. 0·90 mm.

This species differs from *B. variabilis*, Raffr., and *unicolor*, Raffr., from Zanzibar, in the much more elongate and narrower body and the larger size of the tenth joint of the antennæ; from *B. biformis*, Reitter, from the Gold Coast (West Africa) it differs in its much darker colour, smaller size, shorter head and much larger club of the antennæ.

Southern Rhodesia (Salisbury).

Gen. ASYMOPLECTUS, Raffr.,
Trans. S. Afric. Philos. Soc., vol. x. 1897, p. 55.

Asymoplectus semipunctatus, nov. spec.

Elongatus, angustulus, subdepressus, nigropiceus, antennis pedibusque brunneis, pube subtilissima grisea, vix perspicue (magis in abdomine) punctatus. Caput latitudine sua vix longius, antrorsum valde attenuatum, lateribus obliquis, fronte medio leviter depresso, inter oculos foveis duabus magnis, ovalibus, vertice juxta collum vix perspicue impressum, antennæ sat crassæ, gradatim incrassatæ, clava fere inconspicua, articulis 1–2 majoribus, ovatis, 3 subconico, 4–8 moniliformibus, longitudine decrescentibus, 9 transverso, 10 nono multo majori, transverso, 11 breviter ovato, acuminato. Prothorax latitudine sua æquilongus, antice posticeque æqualiter rotundatus, foveis lateralibus validis, sulco transverso profundo, medio angulato et minute foveato, in disco sulco longitudinali obsoletissimo et abbreviato. Elytra latitudine sua dimidio longiora, lateribus recta et parallela. Abdominis segmentis dorsalibus 3 secundo vix dimidio longiori, 4 fere duplo. Metasternum convexum, simplex. Tibiis omnibus extus medio incrassatis.

Mas. Segmentis ventralibus 4 apice medio minutissime et breviter

carinato, 5 angusto, medio quadratim tuberculato, 6 medio inconspicuo, 7 magno, rhomboidali, medio obsolete depresso, latere asymetrico et emarginato.

Femina. Segmento ultimo transversim triangulari, brunneo.

Long. 1·10 mm.

This species comes close to *caviventris*, Raffr., but differs on account of the discoidal impression of the prothorax which is a very faint one, whilst it is strong in *caviventris;* it is also smaller, has a shorter head and less conspicuous club to the antennæ.

Cape Colony (Stellenbosch).

ASYMOPLECTUS FISSUS, nov. spec.

Elongatus, angustus, minus depressus, brunneo-piceus elytris segmentisque ventralibus ultimis brunneis, antennis pedibusque rufis, pube subtilissima grisea. Caput magnum, latitudine sua æquilongum, postice valde rotundatum et juxta collum medio profunde sinuatum, inter oculos foveis duabus magnis et sulcis duobus obsoletis, rectis, in fronte depresso desinentibus. Antennæ sat crassæ, clava conspicua, articulis 1–2 majoribus, subquadratis, 3–8 moniliformibus, 9–10 majoribus, crescentibus, transversis, 11 majori, ovato, acuminato. Prothorax capite brevior, longitudine sua paulo latior, fere cordatus, postice attenuatus, lateribus leviter obliquis, foveis lateralibus magnis, sulco valido, medio valde angulato et minute foveato. Elytra latitudine sua multo longiora, lateribus parallela, recta. Abdomen elytris longius, segmentis dorsalibus 3 præcedenti vix dimidio longiori, 4 majori. Metasternum simplex. Femoribus, præsertim anticis, incrassatis, tibiis medio extus crassioribus.

Mas. Segmentis ventralibus 4 angusto, transversim valde impresso, 5 maximo, late et profunde emarginato et medio lobato, utrinque profunde impresso, medio longitudinaliter convexo, basi breviter sulcato et bicarinato, 6 lateribus tantummodo conspicuo et bidentato, 7 magno, irregulari, asymetrico, dextra arcuatim longitudinaliter carinato, ad sinistram emarginato, medio impresso.

Long. 1·60 mm.

This species is to be distinguished by its larger size, the short and sub-cordiform prothorax, and the complicated structure of the last ventral segments of the abdomen.

Cape Colony (Stellenbosch).

Tribe BATRISINI.

Gen. TRABISUS, Raffr.,
Rev. d'Entom., 1890, p. 110.

Trabisus jugularis, nov. spec.

Læte ferrugineus, nitidus, lævis, parce fulvo-pubescens. Caput transversum, antice attenuatum, temporibus obliquis, rotundatis, inter oculos foveis duabus magnis et sulcis duobus leviter arcuatis in fronte connexis, vertice medio longitudinaliter minute carinatum, infra confertim rugoso-punctatum, profunde et late sulcatum, isto sulco fundo lævi. Antennæ elongatæ articulis 3–7 latitudine paulo longioribus, 8 quadrato, 9 subobconico-truncato, 10 simili sed breviori, 11 fusiformi. Prothorax cordatus, capite fere angustior, sulco transverso lato, profundo, medio sinuato et minute foveato, tuberculis quatuor obtusis, utrinque fovea laterali magna, dico fovea media punctiformi, basi ipsa quadrifoveata. Elytra disperse et minute punctata, latitudine sua paulo longiora, lateribus leviter rotundata, humeris notatis sed obtusis, basi trifoveata, stria dorsali ante medium abbreviata. Abdomen elytris subæquale, segmento primo dorsali sequenti duplo longiori, basi transversim impresso, brevissime bicarinato. Long. 2·70 mm.

This species differs from *T. dregei*, Aubè, chiefly in the absence of the longitudinal furrow of the prothorax.

Natal (Malvern).

Gen. RYBAXIS, Saulc.,
Bullet. Metz., xiv., 1876, p. 96.

Rybaxis africana, nov. spec.

Oblonga, antrorsum leviter attenuata, rufo-ferruginea, breviter flavo-pubescens. Caput latitudine sua multo longius, lateribus obliquis, inter oculos foveis duabus magnis, fronte medio oblonge impresso. Antennæ sat crassæ, articulis 3–6 oblongis et longitudine decrescentibus, 7 quadrato, 8 leviter transverso, cæteris in utroque sexu variabilibus. Prothorax breviter cordatus, capite (cum oculis) latior, utrinque fovea laterali magna, sulco transverso valido et medio minute foveato. Elytra latitudine sua paulo longiora, basi leviter attenuata, humeris notatis, stria dorsali subrecta, leviter sinuata, ante apicem abbreviata et extus recurva. Segmenti primi

dorsalis carinulis validis, maxime divergentibus, mediam partem disci attingentibus et vix quartam basi includentibus.

Mas. Antennarum articulis 9–10 magnis, quadratis, extus leviter compressis, 11 irregulariter ovato, basi truncato, extus leviter compresso. Metasternum late depressum. Trochanteribus intermediis basi transversim carinatis. Segmentis ventralibus primo (conspicuo) et 20 secundo medio levissime depressis.

Femina. Antennarum articulis ultimis minoribus, 9 obconico-truncato, 10 trapezoidali, 11 regulariter ovato, basi truncato. Metasternum vix impressum.

Long. 2·20–2·30 mm.

This species is closely allied to *circumflexa*, Raffr., but the antennæ are much thicker and the joints much shorter. The sexual characters are very different.

Southern Rhodesia (Salisbury).

Gen. REICHENBACHIA, Leach,
Vigors' Zool. Journ., vol. ii., 1826, p. 451.

Reichenbachia dimidiata, nov. spec.

Brevis, convexa, capite, prothorace, antennis basi pedibus rufis, antennis ad apicem infuscatis, elytris et abdomine rubro-castaneis, pube brevi, depressa, grisea. Caput latitudine sua longius, antrorsum attenuatum, lateribus obliquis, inter oculos foveis duabus et in fronte fovea majori. Antennæ parum elongatæ, articulis primo cylindrico, 2 ovato, ambobus majoribus, 3–6 oblongis et latitudine decrescentibus, 7–8 quadratis, 9 præcedenti majori, fere transverso, 10 nono duplo majori, subtransverso, 11 ovato, basi truncato, apice acuminato. Prothorax capite latior, latitudine sua æquilongus, antice posticeque attenuatus, latitudine maxima paululum ante medium, foveis lateralibus mediocribus, a latere distantibus, media punctiformi. Elytra latitudine sua longiora, basi attenuata, humeris parum notata, basi bifoveata, stria dorsali subrecta, ante apicem abbreviata. Segmenti primi dorsalis carinulis validis, paululum divergentibus, mediam partem disci attingentibus et circa quartam includentibus.

Mas. Antennarum articulis tribus ultimis paulo majoribus. Metasternum late nec profunde, longitudinaliter impressum. Segmentis ventralibus 5 apice medio minutissime tuberculato, 6 depresso. Trochanteribus anticis basi minutissime tuberculatis. Femoribus anticis et præsertim intermediis incrassatis.

Long. 1·40–1·50 mm.

This species will be easily distinguished by its peculiar colour.

Southern Rhodesia (Salisbury).

Reichenbachia discreta, Raffray,
Trans. S. Afr. Phil. Soc., 1897, vol. x., p. 93.

The female alone had been described.

Mas. Metasternum late sed obsolete impressum. Segmento ultimo ventrali magno, late deplanato. Tibiis intermediis apice intus minute calcaratis.

I have seen now several specimens and I note that the last joint of the antennæ is generally more or less infuscate.

Southern Rhodesia (Salisbury).

Reichenbachia marshalli, nov. spec.

Brevis, crassa, rubro-ferruginea, pedibus antennisque rufis, istarum articulo ultimo plus minusve infuscato, capite, prothorace elytrisque punctatis, pube brevi subdepressa, grisea. Caput latitudine sua paulo longius, antrorsum vix attenuatum, foveis tribus subæqualibus. Antennæ validæ, breves, crassæ, articulis 3 breviter obconico, 4–7 subquadratis et longitudine decrescentibus, 8 leviter transverso, 9 paulo majori et magis transverso, 10 præcedenti plus duplo majori, trapezoidali et leviter transverso, 11 magno, irregulariter ovato, basi truncato. Prothorax capite paulo latior et latitudine sua nonnihil longior, lateribus parum rotundatis, foveis a latere distantibus, media vix minori. Elytra subquadrata, leviter ad basin attenuata, humeris notatis, basi bifoveata, stria dorsali integra, in angulo suturali desinenti. Segmenti primi dorsalis carinulis validis, paululum divergentibus, mediam partem disci attingentibus et quartam includentibus. Metasternum convexum. Pedes breves, sat crassi.

Mas. Antennæ crassiores, articulis 7–9 magis ac magis transversis, nono fere lenticulari, 10 duobus præcedentibus majori, valde transverso, 11 magno, tribus præcedentibus simul sumptis longiori, irregulariter ovato, leviter compresso, basi truncato. Metasternum vix deplanatum. Segmento ultimo ventrali magno, deplanato, punctato. Trochanteribus intermediis medio tuberculo minuto præditis, tibiis intermediis intus calcare anteapicali munitis.

Long. 1·50–1·80 mm.

This species much resembles *discreta*, Raffr., but can be distinguished at once by its thick antennæ.

Southern Rhodesia (Salisbury).

Tribe CTENISTINI.

Gen. ENOPTOSTOMUS, Schaum,
Wollast. Cat. Col. Can., 1864, p. 528.

Generi *Ctenisti*, Reichb. valde affinis, differt corpore breviore et crassiore, antennarum articulis intermediis majoribus et clava in mare quadriarticulata, multo breviore, palporum articulo 2 mutico, articulis 3 et 4 solis appendiculatis.

Enoptostomus alternans, nov. spec.

Rufus, pallide squamosus. Caput triangulare, tuberculo antennario magno, transverso, sulcato, basi foveato, inter oculos foveis duabus validis. Palporum articulo 3 ovato, oblique sito, 4 angusto, fusiformi, transverso, ambobus longe appendiculatis. Prothorax ovato-truncatus, foveis tribus sulciformibus, magis squamosis. Elytra latitudine sua multo longiora, basi attenuata, lateribus obliquis vix rotundatis, humeris notatis, subcarinatis, stria dorsali integra, valida, leviter arcuata. Metasternum sulcatum.

Mas. Antennarum articulis 1–2 majoribus, 3–7 moniliformibus, quadratis, 8 cylindrico, quatuor præcedentibus simul sumptis æquali, 9 fere quadrato, 10 vix crassiori sed paulo longiori, 11 magno, duobus præcedentibus inæquali, irregulariter ovato. Segmento 2 dorsali primo vix majori.

Femina. Antennæ breviores, articulis 1–2 majoribus, 3–7 longitudine gradatim decrescentibus, 3 triplo, 7 vix dimidio latitudine sua longioribus, 8 transverso, 9 paulo majori, minus transverso, 10 multo majori, subquadrato, 11 magno, tribus pæcedentibus simul sumptis longiori, subcylindrico, apice obtuso. Segmento dorsali 2 primo fere dimidio majori.

Long. 1·40 mm.

This species differs from every other one known in the eighth joint of the antennæ being elongate in the male.

Southern Rhodesia (Salisbury).

Tribe TYRINI.

Gen. CENTROPHTHALMUS, Sch.,
Bestr., Mon.; Psel., 1838, p. 7.

Centrophthalmus grandicornis, nov. spec.

Ferrugineus, longe pilosus. Caput elongatum, subtriangulare, tuberculo antennario latitudine sua longiori, cordato, basi transversim

haud impresso, valde sulcato, isto sulco cum fovea frontali postice juncto, foveis duabus validis in linea oculorum anteriori sitis, spina infra-oculari brevi, crassa, acuta. Antennæ validæ, elongatæ, clava magna, dimidiam partem antennæ æquanti, articulis primo cylindrico, 2 latitudine sua paulo longiori, 3–6 paulo minoribus, sed magis elongatis, 7 paulo breviori, fere quadrato, 8 cylindrico, septimo plus quam triplo longiori, 9 præcedenti simili sed paululum crassiori, 10 paulo crassiori et breviori, 11 magno ad medium incrassato et apice obtuso. Prothorax breviter cordatus, foveis lateralibus elongatis, media lata sed obsoleta. Elytra basi parum attenuata, humeris notatis. Segmento 2 dorsali primo paulo majori, carinis apicem attingentibus. Metasternum vix sulcatum.

Long. 2·80 mm.

This species is very much like *marshalli*, Raffr., but it is larger, the seventh joint of the antennæ is shorter, and the infra-ocular spine is much shorter.

Southern Rhodesia (Salisbury).

Centrophthalmus gracilis, nov. spec.

Rufus, breviter pilosus. Caput minus elongatum et antice minus attenuatum, tuberculo antennario subtriangulari, obsolete breviter sulcato, basi transversim obsolete impresso, fovea punctiformi libera, in linea oculorum anteriori foveis duabus mediocribus, spina infra-oculari gracili, acutissima. Antennæ validæ, crassæ, articulis 1 subcylindrico, 2 latitudine sua paulo longiori, 3–6 minoribus, fere transversis, 7 quadrato, 8 oblongo-ovali, præcedenti fere triplo longiori, 8–9 subovatis, paululum brevioribus et crassioribus, 11 magno, ovato, basi truncato, apice obtuso. Prothorax latitudine sua paulo longior, subcordatus, foveis lateralibus elongatis, media mediocri sed profunda. Elytra basi parum attenuata, humeris subrotundatis. Segmento 2 dorsali primo fere duplo majori, carinulis ante medium segmenti secundi abruptis. Metasternum vix sulcatum.

Long. 1·60 mm.

This species is much smaller and lighter in colour than *C. marshalli*, Raffr., and *C. grandicornis*, Raffr., it is much more like *brevispina*, Raffr., but the infra-ocular spine is well developed, thin, rather long, and the antennæ are larger.

Southern Rhodesia (Salisbury).

The types of all these species are in my collection; those from Salisbury and Natal were captured by Mr. G. A. K. Marshall, those from Stellenbosch by myself and Mr. L. Péringuey.

VII.—*Description of Seven New Species of the Family Mutillidæ (Order Hymenoptera) in the South African Museum.*—By L. Péringuey, *Assistant Director.*

Gen. METHOCA, Latr.,
Hist. Nat. d. Insect, 1805, xiii., p. 268.

Methoca procera, n. spec.

♀. Black with the legs piceous, and the apical abdominal segment piceous red; antennæ briefly pubescent; mandibles with a small inner tooth near the apex, head covered with very closely set round punctures, and clothed with a very short greyish pubescence; the antennal tubercles are very small and set under a rounded, longitudinal median frontal elevation divided in two by a fine longitudinal groove; the eyes are large, set forward, and occupy about the anterior median part of the sides, the posterior angles are much rounded, but not attenuate, and the base is distinctly sinuate; the prothorax is a little dilated, but not rounded laterally, the mesothorax is bi-partite, and the metathorax is a little narrowed in front, dilated laterally behind and strongly declivous but not vertical at apex; the whole upper part is deeply and irregularly punctured, but not striolate except on the sides and on the posterior part of the mesosternum; abdomen pedunculate, first and second segments smooth and very finely aciculate, third segment clothed with a very short sericeous pubescence disposed transversely in the middle, fourth, fifth, and sixth entirely pubescent, the last segment is closely aciculate on each side; legs very long, slender, densely setulose, spurs slightly brownish, but not dark.

Larger and more robust than *M. hæmorhoidalis*, Westw.; it differs by the absence of striation on the upper side, except for a small trace of it on the posterior part of the mesothorax; the prothorax is

not so roundly ampliate, and the metathorax is more nodose towards the declivity; the frontal groove is much more distinct, and the punctuation of the head very different, the punctures being smaller and very closely set, instead of being large and scattered about the striolate background. Length 18 mm.

Hab. Transvaal (Johannesburg). A. Ross, Esq.

Gen. APTEROGYNA, Latr.,
Gen. Crust. et Insect, iv., 1809, p. 121.

Apterogyna cybele, Pér.,
Annals S. Afric. Mus., vol. i., 1898, p. 35, ♀.

♂. Black, not very shining, and clothed with a long, very dense and very fine whitish pubescence, antennæ with the exception of the basal joint and legs reddish; head small, closely and broadly punctate, eyes vertical, set in the anterior part, posterior part a little obliquely attenuate with the posterior angle rounded, basal joint of antennæ not distinctly impressed in the anterior face; thorax rugose but shaped absolutely like that of *A. globularia;* the three first joints of the abdominal segments are a little more elongate than in *A. globularia,* and more conical; they are covered on the upper side with very closely set foveæ on the first and second, and with big punctures on the third, and are alveolate beneath, but the other segments are closely punctulate above and underneath, and the hooked spines of the trochanters are strongly developed; the tegulæ are small and light brown, the wings are hyaline with the nervules light chestnut brown, the anterior margin of the fore-wings above the stigma is narrowly suffused with the same colour, and there is a large, transverse patch of light brown reaching from the anterior margin to the median part of the wing and situated at a short distance from the apex. Length 12–13 mm.

Hab. Cape Colony (Willowmore). Dr. H. Brauns.

It is most probable, judging from the difference in the two sexes of this species, that *Apterogyna globularia,* Fab., is the male of *A. climene,* Pér.

Gen. MUTILLA, Linn.,
Syst. Nat. Ed. 10*a*, 1758, p. 343.

Mutilla (Dasylabris) phrygia, n. spec.

♀. Head, prothorax, basal joint of abdomen, antennæ, and legs pale brick-red, spurs of tibiæ fuscous, abdominal segments, except

the basal one which is densely fringed at base with flavescent hairs, black, and with the basal lateral part of the second and third, and the whole of the fourth clothed with flavescent hairs; mandibles sharp at tip, scape and basal joints of the flagellum densely hairy, the hairs silky white, first joint short, conical, second twice as long as the first, and of the same length as the third; head small, densely clothed with silky white pubescence, eyes occupying nearly one-half of the sides, posterior angles very much rounded; it is about as broad as the anterior part of the prothorax, and is roughly and deeply foveolate; thorax truncate at tip and nearly straight, ampliate obliquely laterally from the anterior angle to near the median part, and more obliquely attenuate from there to the vertical declivity where it is about one-third narrower than at the base; it is somewhat convex, deeply foveate, the declivity is gradually sloping, the sides are not much serrulate, and towards the apical slope there is a moderately distinct tubercle; abdomen petiolate, first segment not very long, strongly nodose, punctate, setose, second segment ovate, covered from the base to two-thirds of the length with conspicuously elongate foveæ having raised walls, but with the foveæ smaller and the intervals sub-striate in the apical part; median part of pygidium strongly striate longitudinally from the base to half the length, ventral carina of first segment somewhat bluntly tri-dentate. Length 8 mm.

Hab. Cape Colony (Uitenhage). Rev. J. A. O'Neil.

MUTILLA NAÏS, n. spec.

♀. Black, with the prothorax ferruginous red, somewhat dark; abdomen sessile, and having a white pubescent patch in the centre of the basal margin of the first segment, a supra-lateral round patch on each side of the median part of the second; the whole of the third segment is covered by a white band, and so is the apical segment; spurs of tarsi white; mandibles rufescent, compressed, the left one truncate and distinctly trifid, the right one strongly dentate on the upper side, at about the middle of the upper part, obliquely attenuate from there, and with another small tooth between the median and the slightly bifid apical point; antennal tubercles sub-rufescent, scape slightly piceous red, not densely hairy, basal joint of flagellum very short, conical; head very briefly and somewhat sparsely pubescent, broader than the prothorax, a little attenuate laterally behind the eyes which are large and set forward, and with the posterior angles well rounded; it is covered with elongate, irregular,

closely set alveolæ, the walls of which hardly form a plication even at about the median part; thorax sub-parallel, but a little emarginate laterally in the middle, not broader in the anterior part, which is sloping on each side, than at the apex where it is almost vertically declivous, and covered with deep, elongate foveæ, with moderately raised, sinuose walls; the sides are serrulate, and in the median posterior margin there is a sharp, longitudinal carina, ending in an acute, horizontal spine above the declivity, and having three a little more slender ones on each side of it; the outer angles are sharp, but not spinose; abdomen sessile, basal joint ampliate and fitting against the second one, but not quite as broad, second ampliato-ovate; all the segments are closely punctate, the punctures in the central dorsal part of the second are deeper and slightly elongate, but have no raised walls, and the whole of the pygidium is striate longitudinally. Length 10 mm.

The shape of the mandibles and the spines on the declivous part of the prothorax will easily lead to the identification of this species.

Hab. Natal (D'Urban). C. N. Barker, Esq.

MUTILLA CAMILLA, n. spec.

♂. Black, with the metathorax ferruginous red; prothorax with a clothing of dense, sub-flavescent hairs, apical part of the petiolate basal abdominal segment and also of the second, narrowly fringed with fulvescent hairs, third segment entirely covered by the same pubescence; head small, with the eyes large, prominent, non-emarginate occupying nearly half the sides, rugose, clothed with black and slightly flavescent hairs, the flavescent hairs situated on the vertex; mandibles with a sharp tubercle underneath, arcuate, sharp at tip, and with two inner small but distinct teeth between the median part and the apex; antennæ somewhat massive, basal joint deeply grooved longitudinally in front; thorax sub-hexagonal, truncate in front, deeply foveolate on the whole of the upper side, but with the foveæ on the metathorax broader; the mesothorax is not carinate or grooved, but the posterior angles are produced in a long, slightly curved horizontal spinose tooth; the metathorax is convex, very much rounded laterally and very sloping; the tegulæ are partly ferruginous red, the wings smoky, the radial cell is truncate, the stigma is indistinct, and there are three cubital cells; the abdomen is petiolate, the basal joint is strongly nodose, deeply foveate, and set with long black hairs, the second is globose, densely hairy and covered for two-thirds of the length with sub-foveolate round

punctures with the intervals very little raised, the other segments are very closely and distinctly punctured, and the ventral carina of the first joint is short and almost triangular; spurs of tarsi black. Length 11–11½ mm.

Hab. Cape Colony (Uitenhage). Rev. J. A. O'Neil.

Mutilla (Dasylabris) mashuna.

♂. Black, covered with dense black hairs, dorsal part of the pro- and meso-thorax clothed with an orange-red pubescence, basal part of the first and second abdominal segments having a dense fringe of silvery white hairs, third one entirely clothed with the white hairs; head moderately small, clothed with a black pubescence, deeply and closely punctured, eyes moderately large, not emarginate, jaws simple, joints of antennæ moderately thick, basal joint deeply grooved in the internal face, and with the walls of the groove carinate; pro- and meso-thorax deeply punctured, not very densely pubescent laterally, scutellum simple, not raised, metasternum parallel laterally and with the outer angles moderately rounded, strongly declivous, and deeply foveate; tegulæ black, wings smoky, but with a chalybeate tinge from the median to the apical part, radial cell a little obliquely truncate at tip, stigma small, opaque, three cubital cells; abdomen sub-petiolate, basal segment and the greatest part of the second, deeply and closely foveolate, the other segments and also the apical part of the second closely and deeply punctured; the black pubescence is very thick, the ventral carina of the first segment is very sharp and truncate, the edges of the second and third segments are edged beneath with white hairs, some of which are also scattered on the pectus, the femora have a fringe of these white hairs, and the spurs of the tibiæ are black. Length 13 mm.

This species resembles a little the ♂ of *M. mephitis*, Sm. (*M. coryphasia* ♂, Pér.), but the mandibles are not so strongly dentate inwardly before the tip, nor is the sub-vertical tooth beneath as greatly developed, and the basal joint of the antennæ is strongly grooved, which is not the case in *M. mephitis*—the prothorax and mesothorax of which are clothed with black hairs only.

Hab. Southern Rhodesia (Salisbury). Rev. J. A. O'Neil.

Mutilla zoë, n. spec.

♂. Black, with the first and second abdominal segments red; head short, very transverse, densely clothed with greyish white hairs on

the vertex and in the frontal part; it is very deeply punctate; the eyes are large, vertical, emarginate, and the posterior angles are not much rounded; mandibles arcuate, sharp at tip and with a small inner tooth near the apex, no median tubercle or vertical projection beneath; antennæ moderately robust, scape strongly punctate but not grooved, first joint of flagellum very short, second and third of nearly equal length; mesothorax much rounded laterally, mesosternum convex, and with three smooth longitudinal carinæ, metasternum a little sinuate laterally, but sub-parallel, and with the outer angles moderately rounded; the surface is deeply punctured and that of the metasternum is alveolate and clothed with black hairs intermixed with white; these white hairs are denser on the pronotum, and especially on the scutellum which is convex and simple; abdomen sub-sessile; the first joint is not quite as broad at apex as the second, all are covered with closely set punctures which are larger on the first and second segments, and all of them have a fringe of not quite decumbent not very thick hairs and indistinctly interrupted at middle, except on the first and second segments where they are a little denser and shorter; the under side and legs are clothed with similar whitish hairs, and the tibiæ are non-spinose outwardly and have white spurs; the ventral carina of the first segment is bi-dentate, and the second segment has a median, smooth, raised line, culminating at apex in a triangular smooth space; tegulæ piceous red, wings smoky except near the base, and having a small hyaline dot in the radial cell, a hyaline transverse line in the second and third cubital, and a dot at the apex of the second discoidal, stigma cellular, radial cell not truncate. Length 11 mm.

Hab. Cape Colony (Uitenhage). Rev. J. A. O'Neil.

This species is allied to *M. speculatrix*, Sm., but is different.

NOTE.

Mutilla autonoë, Pér., is pronounced by Dr. H. Brauns, who has caught it *in copulâ*, to be the male of *M. merope*, Sm.

Mutilla artemisia, Pér., ♂, is identical with *M. atropos*, Sm., with which *M. albistyla*, Saus., is probably synonymous.

The name of *Mutilla clelia*, Pér. (Ann. S. A. Mus., vol. i., p. 443), should read *M. cecilia*, Pér.

The name of *Mutilla cyllene*, used by me for an African species (Ann. S. A. Mus., i., p. 444) having been already used for an American species, must be changed into *M. saga*.

VIII.—*Description of a New Species of the Genus Japyx (Order Thysanura) from the Cape Colony.*—By L. Péringuey, *Assistant Director.*

Family JAPYGIDÆ.

Gen. JAPYX, Halid.,
Trans. Lin. Soc., vol. xxiv., p. 441, 1864.

Japyx purcelli, n. spec.

Ivory-white turning to pale straw colour in the adult, but with the three penultimate segments and the forceps pale chestnut brown.

♂. Head ovate, almost white, but having in the centre of the frontal part an orbicular, slightly flavescent patch limited by a transverse arcuate impressed line; the posterior part of the head is grooved longitudinally, and the median part of the base is distinctly emarginate; it is dotted with numerous rigid setæ, apical joint of maxillary palpi longer than the preceding, and projecting beyond the mouth cavity; the antennæ reach as far as the apex of the metathorax and have thirty-six joints, which are moniliform, swollen in the middle where there is a distinct ring of not closely-set setæ, and decreasing gradually in size from the four basal joints which are glabrous, of equal length, slightly conical, but not quite as wide as the fifth; the three leg-bearing segments are produced on the upper side in a plate slightly overhanging the connecting membrane, attenuate obliquely backwards and longitudinally grooved in the middle, but not so deeply as in the seven abdominal segments following, which are transverse, twice as wide as long, of nearly equal width and have the edges sharp and horny, but the seventh is sharply toothed in the posterior angle, the eighth segment is horny, like the two following, and a little narrower than the one before, the ninth is of equal width

but much narrower, and the last one is a little longer than the two preceding put together and is bi-carinate laterally; the forceps are slightly reflexed, equal in length to the last segment and the branches are straight outwardly, but curved at tip; the inner part is serrulate and the left branch has a minute, not very distinct tooth at a short distance from the tip, while the right one, which is also serrate inwardly, has a distinct tooth at about one-third of the length; on the upper part each segment has on each side a dorsal series of duplicate setæ and a similar marginal one, but there is a semicircular series on the three prothoracic segments; the spiracles are very distinct, except on the three last horny joints, and the ventral side is densely bristly; the three last horny segments bear also numerous fulvous bristles which are still denser on the forceps, and the seven basal abdominal joints have an apical, lateral, tri-articulate claw-like process; the penultimate ventral segment is deeply incised in the middle.

♀. Usually a little larger than the male, a little more ampliate laterally and easily recognised by the shorter antennæ, the more robust forceps, and the shape and sculpture of the three last segments of the body. The antennæ reach barely the base of the mesothorax; they have forty-two joints, the four basal are glabrous, the second and third are a little longer than the basal one, the fourth is much smaller, the ten joints following are somewhat compressed, transverse, twice as broad as long, set very closely together, briefly and densely setulose, and are gradually decreasing in length; the other twenty-eight are also gradually attenuate, but although being as nearly closely set as the previous ten, they are not quite so transverse and are more convex; the fifteenth joint is distinctly smaller than the fourteenth; the three apical segments, which in the male are simply punctate and have only lateral or marginal setæ, are very rugose, almost roughly shagreened and are densely setose all over, the forceps are also much more strongly serrate and the inner teeth are much stronger; the seventh dorsal segment is ampliate laterally and the dentate apical angle is stronger; beneath the penultimate ventral segment is obliterated; the three thoracic dorsal segments are more developed, and being much more deeply impressed longitudinally in the centre, they have more the appearance of wing-cases.

This species, and probably the others also, is very pugnacious. It curves its back so as to bring the forceps over its head in fighting, and examples have been known, when kept in a small receptacle, to cut one another in two. They are found under stones in the adult

stage, but I have met with the young in gardens when the ground is being dug. In spite of their being eyeless these insects are extremely agile, being greatly helped, like most blind insects, by the stiff setæ of the body, which are doubtless sensitive to light.

I propose to name this interesting insect after my colleague, Dr. W. F. Purcell, who was the first to discover it.

Length (adult) 16–22 mm.; width $1\frac{1}{2}$–3 mm.

Hab. Cape Colony (Cape Town, Stellenbosch, Paarl, Knysna, Mossel Bay).

IX.—*On some South African Arachnida belonging to the Orders* Scorpiones, Pedipalpi, *and* Solifugæ.—By W. F. Purcell, Ph.D. *First Assistant.*

The present paper comprises a revision of the South African Scorpions of the genus *Parabuthus*, descriptions of 7 new species and 3 new varieties of Scorpions, 1 new Pedipalp, 9 new species and 1 new genus of *Solifugæ*, and a list of new localities for species of *Uroplectes*, *Opisthophthalmus*, *Solpuga*, and *Hexisopus*, together with notices of the local variations in structure or colouration so frequently met with in many cases.

Order SCORPIONES.

Gen. BUTHUS Leach.

Buthus arenaceus, n. sp.

♀. *Colour.*—Cephalothorax with its anterior margin, its crests and the ridges above the lateral eyes black; the ocular tubercle also black, except along the mesial groove, which is yellow; tergites of abdomen each greenish-ochraceous anteriorly but pale yellow posteriorly, the crests, especially the lateral ones, blackened; superior crests of pedipalps and the 4 inferior crests of tail finely blackened.

Cephalothorax wider than long; the upper surface hairless densely and finely granular throughout; the crests, including the superciliary ones, granular; the middle and posterior medial crests united on each side, forming a sharp angle at the junction which is

situated just midway between the median eyes and the hind margin, the area enclosed between these medial crests, therefore, suddenly constricted in its middle and attenuated in its anterior half; middle lateral crests weak, especially posteriorly, not reaching the medial crests. Ocular tubercle finely granular between the crests.

Tergites of abdomen all very densely and finely granular throughout, with 3 finely granular crests which are not recurved in the anterior segments.

Sternites of abdomen all, including the first, densely and finely granular over the whole surface, the last with 4 very distinct, finely granular keels; segment 4 with 2 distinct lateral and 2 very weak and short, medial, finely granular keels, segments 2–3 with finely granular lateral keels, but no medial keels, segment 1 without keels.

Tail moderate, with very few hairs; segments 2–6 of equal width, decidedly narrower than segment 1; segments 1–4 with 10 finely granular, well-developed crests; segment 5 with very finely granular superior and finely granular infero-median crests, the infero-lateral crests finely granular anteriorly but composed of coarser lobe-like teeth posteriorly, the accessory crests of the under surface distinguishable in the anterior half of the segment, the lateral surfaces with rudiments of an accessory crest along the middle and lobate at hind margin. All the caudal surfaces densely and finely granular throughout in segments 1–5; the vesicle weakly granular, only the upper surface, a lateral and 2 inferior longitudinal bands smooth. Upper surface grooved along the median line in all the segments, and provided in segments 1–4 with a median area which is more minutely and densely granular than the lateral portion of the upper surface; this median area bordered on either side by a row of larger granules; upper surface in segment 5 strongly convex on each side of the median groove throughout the whole length, the convex portions densely granular and much more elevated than the superior crests. Vesicle very stout, at least as wide as and very much higher than segment 5; the aculeus weak, very short, much shorter than the vesicle.

Pedipalps.—Femur finely and densely granular on all sides. Tibia finely and densely granular, the granulation on the almost smooth posterior surface very weak and minute, the anterior and posterior sides almost parallel in the middle third. Hand slenderer than the tibia, very minutely granular, the posterior surface almost smooth; hand with 2 anterior and 2 posterior weakly crenular or almost smooth crests, and with rudiments of other crests on the upper

surface; fingers with 11 main rows of teeth, the movable finger with 12 anterior flanking teeth, its length $2\frac{1}{6}$ times that of hand-back.

Legs.—Femora and tibiæ finely granular, with granular keels.

Pectines with 18 teeth, the posterior basal lamella of the scape sharply angular at the posterior inner corner, bearing 2 teeth on its hind margin, the scape itself not reaching apex of trochanter.

Locality.—1 ♀ (Reg. No. 2206) found by Mr. M. Schlechter between Henkries and Wolftoon in Little Bushmanland, Namaq. Div., Cape Colony, in February. As no genital stylets could be found I conclude the specimen must be a ♀.

Measurements.—Total length 35 mm.; length of cephalothorax $4\frac{1}{3}$, of tail 21, of fourth caudal segment $3\frac{1}{2}$, of tibia of pedipalp $4\frac{1}{2}$, of movable finger 5; width of fourth caudal segment 2, of tibia of pedipalp 1·6.

This is, I believe, the second specimen of the genus recorded from South Africa, the only other example being the type of *B. conspersus* Thor. from "Caffraria." The latter, besides being greenish-red, with 5 rows of black spots above, the vesicle banded with infuscate stripes and the legs and pedipalps spotted with black, has almost smooth abdominal sternites but appears to agree in almost every other respect very closely with *arenaceus*. C. L. Koch (Arach. *v.* 6, p. 77) has also recorded a specimen of *B. thessandrus* (Koch) from the Cape, but this locality seems doubtful.

Gen. PARABUTHUS Poc.

(A revision of the South African species.)

A revision based on an examination of a large series of specimens from different localities is still needed for a clear conception of the South African species of this genus, and although several of the described species are still unrepresented in the Collection the latter is nevertheless sufficiently large for this purpose, as the list of specimens given below will show.

Specific Characters.—Excellent specific characters showing little or no variation are afforded by (1) the form and size of the shagreened area on the upper surface of the first caudal segment, (2) the degree in which the middle lateral keel is developed in the fourth segment, (3) the granulation of the lower surface and of the

upper edges of the fifth segment, (4) the relative width of the tibia and hand of the pedipalp in the adults of both sexes, (5) the shape of the tibia of the pedipalp, (6) the form of the posterior upper edge and of the infero-lateral keels of the second and third segments, (7) the size of the vesicle, &c. Slightly more variable but not unimportant characters are the relative width of the caudal segments, the duplication of the superior crests in segment 4, the form of the basal lamella of the scape of the pectines in the ♀, &c. The form of the shagreened area on the second caudal segment, the number of the flanking teeth on the fingers of the pedipalps, the colouration, and a few other characters, may vary considerably in the same species according to the locality of the specimens.

Sexual Differences.—The ♂, even while young, is easily distinguishable from the ♀ owing to the presence of a pair of little chitinous stylets, which are situated in the posterior region of the genital orifice and become visible on lifting the halves of the operculum. In the ♀ the operculum is also divided into two halves, but there are no stylets. Besides this there are other sexual differences, notably in the structure of the pectines. In the ♀ the basal lamella of the scape bears one or no teeth on its posterior side, which is nearly always produced into a large, broad, obtuse lobe. In the ♂ the scape is generally angular and only slightly, if at all, produced at the base behind and toothed almost throughout its length, the basal lamella mostly bearing 2 or 3, rarely only 1 tooth on its hind margin. The basal lamella is, however, produced in the ♂ of *calvus* and not produced in the ♀ of *granulatus*. Sometimes also the proximal tooth of the pectines is reduced in size in the ♀. The number of the teeth generally runs higher in the males than in the females. In the adult ♂ also the hand and to a lesser degree the tibia of the pedipalp is generally stouter, the fingers are relatively shorter, and the granulation of the tergites and cephalothorax is sometimes more pronounced than in the ♀. In all stages preceding the adult form the hand and fingers of the ♂ nearly resemble those of the ♀ in their proportions. I have been unable to detect any differences in the tail between the ♂ and ♀ which may with certainty be regarded as sexual characters.

Distribution.—The narrow strip of rainy country along the south coast is inhabited by a single species, *capensis*, which is, however, very abundant and extends from the Divs. of Tulbagh, Worcester, and Caledon in the west, eastwards at least as far as the Divs. of Port Elizabeth and Albany. Northwards the species extends for a short distance into the lower parts of the Karroo, where it mingles

with *neglectus* and *granulatus*, *e.g.*, in the Divs. of Worcester, Robertson, and Uitenhage. To the north-east of this coast strip is an area of unknown extent but comprising the Divs. of Graaff Reinet and Albert, which is inhabited by a variety of *capensis* which I have called *frenchi*.

To the north of the rainy coast strip is a vast dry and elevated area of karroo-like country with very little rain, inhabited principally by the two species *neglectus* and *granulatus*, which are found right up to Bushmanland and German South-West Africa, while to the east *granulatus* has been found to occur as far as the Divs. of Victoria West and Uitenhage. The actual northern and eastern limits of these species are, however, not yet known.

P. calvus has been found in only two localities in the Divs. of Calvinia and Clanwilliam, *i.e.*, within the distribution area of *neglectus* and *granulatus*. It is, however, exceedingly rare.

In the north-western part of Cape Colony is an extremely arid tract of country known as Great and Little Bushmanland (forming part of the Divs. of Kenhart and Namaqualand), the fauna of which appears to resemble that of German South-West Africa rather than that of the rest of Cape Colony. In this region no fewer than six species, viz., *brevimanus*, *lævifrons*, *villosus*, *schlechteri*, *neglectus*, and *granulatus*, have recently been collected by Mr. Max Schlechter, who found them living side by side. Of these the first four are not known to occur in other parts of the Colony to the south of the Orange River, while at least four, but probably all of them, are found in German South-West Africa. From the latter region another form, *P. raudus* (Sim.), has been recorded by Simon.

The only other species which have been described from Cape Colony are *P. flavidus* Poc., *P. obscurus* and *pachysoba* Penth., all from Bechuanaland, but unfortunately the Museum possesses no material from this part of the country.

Only one species, *P. transvaalicus* Purc., has been recorded from the Transvaal, and one, *P. mosambicensis* (Pet.), from Rhodesia.

The South African species known to me may be determined from the following table :—

a. Posterior upper edge of 2nd caudal segment strongly elevated and curved forwards in the middle. Legs yellow. Western Divs. of Cape Colony (from Tulbagh and Worcester Divs. northwards), German South-West Africa .. .. 5. *P. neglectus* Purc.

b. Posterior upper edge of 2nd caudal segment perfectly straight.

a[1]. Sides and under surface of 4th caudal segment densely and finely

granular throughout, but without crests. Bushmanland (Cape Colony), German South-West Africa .. .. 3. *P. brevimanus* (Thor.).

b^1. Sides and under surface of 4th caudal segment either with crests or not densely granular throughout.

a^2. Middle lateral crest on 4th caudal segment strong and well developed, coarsely granular throughout.

a^3. Superior crest in segment 5 more or less obliterated in the middle of the segment by the dense granulation of the sides, which extends here over the superior edges right up to the indistinct row of 4–6 low rounded (rarely conical) granules representing the accessory crests. Cephalothorax finely granular. (Upper surface of 1st caudal segment very flat, as wide as long, with parallel sides, the shagreened area occupying more than half the width of this surface. Hand never thicker than the tibia of pedipalp.)

a^4. Upper surface of 2nd caudal segment with large shagreened area extending continuously from anterior to posterior margin. South-coast Divs. of Cape Colony .. 1*a*. *P. capensis* (H. & E.).

b^4. Upper surface of 2nd caudal segment with an oval shagreened area on its anterior half. North-east Divs. of Cape Colony. 1β. *P. capensis* var. *frenchi*, nov.

b^3. Superior crest in segment 5 always distinct throughout the whole length and very strong, sometimes slightly weaker in the middle of the segment, flanked here on the inner side by a short accessory crest of very coarse, generally sharply pointed or subspiniform, sometimes blunt, tubercles. Cephalothorax rather coarsely granular.

a^5. Segment 4 of tail always decidedly narrower than segment 1, the tail more or less densely hairy. Congo, Benguela, German South-West Africa, Bushmanland (Cape Colony.) 6. *P. villosus* (Pet.).

b^5. Segment 4 of tail wider or at least not narrower than segment 1, tail sparsely hairy.

a^6. Caudal segments thickly granular at the sides and below, especially in the posterior segments. Legs and pedipalps dark brown to black. Transvaal. 7. *P. transvaalicus* Purc.

b^6. Caudal segments sparsely granular, the posterior segments below more thickly granular. Legs and pedipalps yellow. Bushmanland .. .. .. 8. *P. schlechteri* Purc.

b^2. Middle lateral crest on 4th caudal segment rudimentary, except perhaps quite posteriorly.

a^7. Tibia of pedipalps strongly prominent on anterior side, its length along the upper side only about twice its width at base of large anterior tooth. Cephalothorax about as long as wide. Bushmanland (Cape Colony), German South-West Africa. 4. *P. lævifrons* (Sim.).

b^7. Tibia of pedipalps slender, its length 2½–3 times its width. Cephalothorax much wider than long.

a^8. Upper surface of 1st caudal segment flattened, projecting step-like and then suddenly descending perpendicularly at the anterior margin of the very broad shagreened area; 4th and 5th segments almost smooth or with a few granules below. Calvinia and Clanwilliam Divs. .. .. .. 2. *P. calvus* Purc.

b^8. Upper surface of 1st caudal segment not flattened but hollowed out from side to side, the narrow shagreened area not projecting step-like anteriorly but descending gradually in a median groove; 4th and 5th segments very densely granular below. Western half of Cape Colony (except along south coast), German South-West Africa .. .. 9. *P. granulatus* (H. & E.).

§ A.—*Species in which the hand of the pedipalp is equally slender in the adults of both sexes, and never exceeds the tibia in width.*

1*a*. Parabuthus capensis (typicus) (H. & E.).

1828. *Androctonus c.*, Hemprich and Ehrenberg, Symb. phys., Scorp. No. 10.

1839. *A. Iros*, C. L. Koch, Arach., *v.* 5, p. 93, fig. 101.

1844. *A. Kochii*, Gervais in: Walckenaer, Ins. Apt., *v.* 3, p. 45 (Koch's species renamed).

1889. *Buthus planicauda*, Pocock, Ann. Mag. N. H. (6), *v.* 3, p. 344, pl. 15, fig. 5. (The specimens described by Pocock as the ♂ of this form belong to a different species, as they have incrassated hands.)

1899. *Parabuthus capensis*, Kraepelin, Das Tierreich, Scorp. and Pedip., p. 31. (Here also the ♂, described as having incrassated hands, belongs to a different species.)

1900. *P. c.*, Penther, Ann. Naturh. Hofmus. Wien, *v.* 15, p. 154.

♂ ♀. *Colour.*—Trunk (cephalothorax and abdomen) varying from ochre-yellow to dark olive-green; tail mostly ochraceous, sometimes pale yellow or brownish to greenish-yellow, posterior segments not blackened; legs and pedipalps pale yellow (sulphur-yellow in fresh specimens, becoming more ochraceous under the action of spirits).

Cephalothorax broader than long, its upper surface densely and rather finely granular throughout and almost devoid of hairs; eye-tubercle granular except on the smooth superciliary ridge, moderate in size, the eyes medium-sized, the distance between them twice, rarely as much as 2½ times their diameter.

Tergites of abdomen densely and finely granular throughout, the granules in the anterior half of each of the first 6 segments very fine; segment 7 with large, finely shagreened, mesial area, thickly granular over the rest of the surface, and provided with 4 strong lateral keels.

Sternites smooth and polished, segments 1–4 granular only at the extreme lateral borders, and, in the ♂, in front of the spiracles; seg-

ment 5 granular laterally in the ♂, less granular or almost smooth in the ♀, its 4 keels smooth or subcrenular.

Tail stout, sparsely hairy; segments 1–4 of equal width, or segments 2–3 slightly wider than segments 1 and 4; segment 4 slightly narrower than, as wide as, or even slightly wider than segment 1; segment 5 high, segment 1 intermediate between segments 4 and 5 in height; vesicle large, its width $\frac{3}{4}$–$\frac{6}{7}$ that of the fifth segment in its widest part.

Segments 1–4 with 10 well-developed, granular, sub-moniliform keels; the inferior keels of segment 1 smooth anteriorly; infero-median keels of segment 4 abbreviated or indistinct posteriorly; middle lateral keel of segment 4 well developed throughout its whole length, not at all or scarcely weaker than the adjacent lateral keels of the same segment; superior keels of segments 2–4 often with a posterior granule enlarged and tooth-like, but not spiniform; superior crests in segment 5 distinct and well developed in the anterior third of the segment, and often again quite posteriorly, but more or less obliterated in the middle, where the dense granulation of the sides of the segment spreads over the upper edges right up to the indistinct row of 4–6 low rounded granules which represent the superior accessory crest on either side. Teeth of the inferior lateral keels in segment 5 often only slightly larger and broader posteriorly.

Upper surface in anterior segments reticularly granular laterally, but very finely and densely granular (shagreened) mesially, the upper surface in the posterior segments smooth or nearly so. Segment 1 very flat above, not grooved mesially, its upper surface* as wide as long, with parallel crests; the shagreened area very large, flat or only very slightly depressed, occupying in its widest part a little more than half the width of the upper surface, constricted posteriorly and then widened again at the hind margin, its anterior edge slightly projecting forwards in the middle, very broad, equalling half the width of the upper surface, which descends very suddenly and quite perpendicularly along this edge. Segment 2 also flattened above, its upper surface longer than wide, with parallel crests; the shagreened area generally lightly concave anteriorly, shaped as in segment 1, but longer and narrower, about 2–2$\frac{1}{3}$ times as long as wide, occupying in its widest part half or almost half the width of the upper surface, the anterior edge descending nearly or quite as sharply perpendicularly as in segment 1, and almost straight or curving forwards only slightly in the middle. Segments 3–5 deeply

* By upper surface is meant the highest portion of the segment, which is bordered by the superior crests.

grooved above along the middle, the groove minutely granular in segment 3, but smooth in segment 5.

Lateral and under surfaces thickly and, for the most part, finely granular between the keels, except in segment 1, which is generally more or less smooth below; segment 5 very thickly granular throughout on the sides and below, the under surface with larger blunt granules scattered about between the median and lateral crests, without, however, forming accessory crests, the median crest formed of a raised ridge along which coarse granules are irregularly arranged, often almost biseriately, the anterior part, however, often (more rarely the whole), forming a regular single series.

Pedipalps.—Femur finely granular above. Upper surface of tibia finely but often very weakly granular, without distinct anterior crest; anterior and posterior sides of tibia nearly parallel in the middle, the length along the upper side in the ♀ $2\frac{2}{5}$–$2\frac{1}{2}$ times, in the ♂ $2\frac{1}{2}$–$2\frac{2}{3}$ times its width at the base of large anterior tooth. Hand smooth, slender, its width equalling or even slightly less than that of the tibia in both sexes; length of movable finger in the ♀ about $2\frac{1}{5}$–$2\frac{1}{3}$ times, in the adult ♂ slightly less, about 2–$2\frac{1}{5}$ times the length of hand-back, this finger normally with 13, more rarely 12, anterior (inner) flanking teeth (counting in the inner distal pair at the apex of the most distal of the main rows), the main rows composed of 6–9 teeth (including the enlarged tooth) in the middle third of the finger.

Pectines with 28–35 teeth in the ♀, and 32–36 teeth in the ♂, the posterior basal lamella of scape produced into a broad lobe behind in the ♀, normal in the ♂.

*Measurements * of a* ♀.—Total length 83; length of cephalothorax $8\frac{1}{3}$, width $9\frac{2}{3}$; distance of eyes from anterior margin $3\frac{1}{2}$, from posterior margin $4\frac{1}{5}$; length of femur of pedipalp $6\frac{2}{3}$, of tibia $6\frac{3}{4}$, of hand-back 3, of movable finger 8; width of femur $2\frac{1}{5}$, of tibia $2\frac{3}{4}$, of hand $2\frac{1}{2}$; length of tail 45; length and width of first caudal segment 6, $6\frac{1}{3}$, of second $6\frac{1}{3}$, $6\frac{1}{3}$, of third $6\frac{2}{3}$, $6\frac{1}{3}$, of fourth $7\frac{1}{5}$, 6, of fifth 9, $5\frac{2}{3}$, of sixth $8\frac{3}{4}$, 5; height of fourth segment $5\frac{1}{4}$, of fifth 5; length and width of upper surface of first segment $3\frac{3}{4}$.

* Total length is measured from anterior edge of cephalothorax to tip of sting; length of femur and tibia of pedipalps is taken along the upper side, that of the caudal segments laterally from the hind margin of the segment to the anterior edge of the large angular prominence which terminates the superior crests in front; width of tibia of pedipalps is taken just distal to the large anterior tooth or spike. In measuring the width of the hand, the latter is pressed against the tibia at right angles to it, so that the anterior finger is only a little higher than the movable finger, the width in this position being also equivalent to the greatest transverse diameter of the hand. In the width of the upper surface of a caudal segment the superior crests are included.

Of a ♂.—Total length 65; length of cephalothorax $6\frac{3}{4}$, width $7\frac{1}{3}$; distance of eyes from anterior margin $2\frac{1}{5}$, from posterior margin $3\frac{1}{3}$; length of femur of pedipalp 6, of tibia 6, of hand-back 3, of movable finger $6\frac{1}{3}$; width of femur $1\frac{3}{4}$, of tibia 2, of hand $1\frac{1}{5}$; length of tail $39\frac{1}{2}$; length and width of first caudal segment $4\frac{3}{4}$, 5, of second $5\frac{1}{4}$, $5\frac{1}{6}$, of third $5\frac{1}{2}$, $5\frac{1}{5}$, of fourth $6\frac{2}{3}$, 5, of fifth $7\frac{1}{4}$, $4\frac{3}{4}$, of sixth $7\frac{1}{3}$, $3\frac{5}{6}$; height of fourth segment $4\frac{1}{4}$, of fifth 4; length and width of upper surface of first segment $3\frac{1}{5}$.

Locality.—This description has been taken from 13 ad. ♂, 12 ad. ♀, and a large number of young of various sizes from Slanghoek, Worcester Div.

Besides these, however, there are a number of specimens of all sizes from many different localities, making a total of nearly 300 in the Collection. These have been compared with the above description and found to agree with it so closely that I have been able to detect scarcely any differences worth mentioning. In some males the number of the pectinal teeth runs up to 38. The largest ♀ (from Worcester) measured 97 mm., and the largest ♂ (from Brakkloof) 66 mm.

The species in its typical form appears to be confined to the southern districts of Cape Colony.* It is generally very plentiful, and occurs nearly everywhere within its area of distribution, which, so far as known, extends along the south coast from the Divisions of Tulbagh, Worcester, and Caledon in the west, as far as Port Elizabeth and Albany in the east. This area includes the moister coast-strip as well as the southernmost parts of the more arid karroo.

The following is a list of localities from which specimens of the typical form have been obtained:—

A. *With the movable finger normally with* 12–13, *or with* 13 *anterior flanking teeth, in the latter case varying in some specimens to* 12 *or* 14. (*Western Districts.*)

(*a*) Tulbagh Div.—Piquetberg Road Station (2 examples, *R. M. Lightfoot*); Waterfall Mountains, near Tulbagh Road Station (2 ex., *R. M. Lightfoot, F. Treleaven*).

(*b*) Worcester Div.—Slanghoek (49 ex., *R. Francke, W. F. Purcell*); village of Worcester (18 ex., *R. M. Lightfoot, I. Meiring, W. F.*

* Penther records it from Mossel Bay, Port Elizabeth, Robinson Pass (north of Mossel Bay Div.), Grahamstown, and the Div. of Albany. The locality "West Africa," given by some authors, is doubtless founded on mistaken identification.

Purcell); Brandvlei (12 ex., *I. Meiring, W. F. Purcell*); Hex River Valley (12 ex., *F. Treleaven*); Triangle (1 ex., *R. M. Lightfoot*); Touws River Station (12 ex., *Dr. W. P. Le Feuvre, W. F. Purcell*); Rabiesberg, near Nuy River Station (20 ex., *R. Francke, W. F. Purcell*).

(*c*) Robertson Div.—Village of Robertson (8 ex., *Dr. R. J. M. Melle, W. F. Purcell*); Ashton (4 ex., *E. de Wet, W. F. Purcell*).

(*d*) Caledon Div.—Houw Hoek (9 ex., *W. L. Sclater, W. F. Purcell, Mrs. W. F. Purcell*); village of Caledon (35 ex. from the Venster Ravine, *Mr. and Mrs. Ewald Watermeyer, Mrs. W. F. Purcell, C. L. Leipoldt, W. F. Purcell*); River Zonder Einde (1 ex., *W. F. Purcell*).

(*e*) Bredasdorp Div.—Village of Bredasdorp and Marcus Bay (5 ex., *H. A. Fry*).

(*f*) Swellendam Div.—Avontuur, near Storms Vlei (*Mrs. W. F. Purcell*); Bonnie Vale at Bushmans Drift on Breede River (*Ch. Groom*).

(*g*) Mossel Bay Div.—Town of Mossel Bay (56 ex., *J. L. Drège, W. F. Purcell*).

(*h*) Prince Albert Div.—Village of Prince Albert (2 ex., *W. F. Purcell*). One of these, an ad. ♀, differs from all other specimens in the Collection in having the granules of the superior accessory crests of fifth caudal segment much higher than usual, distinctly conical and almost pointed, and the posterior tooth of the superior crests in segments 2–4 long and rather pointed.

B. *With the movable finger normally with* 14 *anterior flanking teeth, varying in some specimens to* 13 *or* 15. (*Eastern Districts.*)

(*i*) Uitenhage Div.—Dunbrody, on the Sundays River (10 ex., *Rev. J. A. O'Neil*); Coega (1 ex., *J. L. Drège*).

(*j*) Port Elizabeth (16 ex., *J. L. Drège, H. A. Spencer*).

(*k*) Albany Div.—Brakkloof, near Grahamstown, 7 ♀, 7 ♂, and 13 juv. from Dr. Schönland of the Albany Museum (coll. by Mrs. George White); number of pect. teeth in ♀ 28–33, in ♂ 33–36.

The principal feature of *capensis* is the thinness of the hand in the ad. ♂. In almost all the other species of the genus the hand is more or less strongly incrassated in the adult of this sex, and the statement that this is also the case in *capensis*, made by several previous authors, is a mistake, doubtless due to the confusion of several species. I have never observed the upper surface of the tibia of the pedipalps quite smooth, but as the granulation here is often very weak, this may possibly sometimes be the case.

1β. Parabuthus capensis var. frenchi, nov.

A number of specimens, apparently differing from *capensis* solely in the shape of the shagreened area on the second caudal segment, represents a local variety of *capensis*, inhabiting an area to the north-east of that in which the principal form has hitherto been found.

The shagreened area of the second segment forms a short, oval, and often rather deep depression, about $1\frac{3}{4}$ times as long as wide, and occupying slightly more than half the upper surface. At the hind edge of the upper surface a tiny shagreened area occurs in some specimens, and in one case this is almost connected with the anterior area by a few isolated granules scattered along the median line. Movable finger with 13–14 anterior flanking teeth, the main rows as in *capensis*.

(*a*) Types, 1 ♂ and 4 ♀ (all adult) from Graaff Reinet (*Geo. French*) (Reg. No. 5207), and 1 juv. from the same locality (*C. L. Leipoldt*); number of pectinal teeth in ♀ 32–35, in ♂ 40; length of largest ♀ 70, of ♂ 70.

(*b*) 1 ♂ and 1 ♀ from Burghersdorp, presented by Dr. Schönland of the Albany Museum, in which are a number of other specimens from the same locality. These agree with the specimens from Graaff Reinet, except that I did not notice the tiny shagreened area near the hind edge of second caudal segment. Length of ♀ 77, of ♂ 60; number of pect. teeth in ♀ 31–33, in ♂ 36.

This variety was first collected by Mr. French, after whom it has been named.

2. Parabuthus calvus Purc.

1898. *P. c.*, Purcell, Ann. S. A. Mus., *v.* 1, p. 28, pl. iv., fig. 7. ♂.

Besides the typical ♂ we have a ♀ specimen from Clanwilliam Div., which differs in being much more granular and in having a narrower tail. This may perhaps be a different species.

In the type the upper surface of the first caudal segment is wider than long, but the shagreened area is narrower than in *capensis* and only slightly widened in its anterior portion, which is only $\frac{2}{5}$ as wide as the upper surface of the segment. In the second segment the length of the upper surface is equal to its width and the shagreened area is parallel-sided, except for a slight posterior constriction, and a little more than three times as long as wide. The movable finger has 14 anterior flanking teeth and the main rows in the middle third of the finger are composed of 7–9 teeth.

The following are some supplementary measurements, omitted in

the previous description of the ♂ :—Length and width of first caudal segment 5, $6\frac{1}{4}$, of second $5\frac{3}{8}$, $6\frac{1}{4}$, of third $5\frac{3}{4}$, $6\frac{1}{5}$, of fourth $6\frac{1}{2}$, $5\frac{3}{4}$, of fifth 7, $5\frac{1}{4}$, of sixth $6\frac{3}{5}$, $4\frac{1}{4}$; height of first $4\frac{1}{3}$, of fourth $4\frac{3}{4}$, of fifth $4\frac{1}{2}$ (this height was by mistake given as $3\frac{2}{3}$ in the original description); length of upper surface of first segment $3\frac{1}{2}$, width of this surface in its middle $3\frac{3}{4}$.

§ B.—*Species in which the hand in the ad. ♂ is more or less incrassated, exceeding the tibia of the pedipalp in width and thicker than in the ♀ and young.*

3. Parabuthus brevimanus (Thor.).

1877. *Buthus b.*, Thorell, Atti Soc. ital., *v.* 19, p. 110.

1891. *Heterobuthus b.*, Kraepelin, Mitth. Mus. Hamburg, *v.* 8, p. 69.

1899. *Parabuthus b.*, Kraepelin, Das Tierreich, Scorp. and Pedip., p. 32.

? 1901. *P. cristatus*, Pocock, Ann. Mag. N. H. (7), *v.* 7, p. 284. ♀.

Both sexes of this species have been minutely described by Thorell.

The South African Museum possesses only male specimens, viz., 1 from Zandhoogte, near Ramonds Drift on the Orange River (Little Bushmanland), and 1 from near Naroep (Great Bushmanland), both places in Namaqualand Div. (spirit specimens, *Max Schlechter*); also, an old dried ♂ specimen, labelled "Damaraland" (*F. Hodgson*). The dried specimen measures 33 mm. in length, the 2 spirit specimens $36\frac{1}{2}$ mm. and 41 mm., while Thorell's ♂ measured 42 mm. and his ♀ 50 mm. Pocock's ♀ of *cristatus* measured 62 mm. in length.

♂. *Colour.*—The recently killed spirit specimens are pale yellow, the abdomen, excepting along the hind margins of the segments, darkened in one specimen; median eye-tubercle and a curved mark on each side, enclosing the tubercle as in brackets, black.

Cephalothorax somewhat wider than long or as wide as long, finely granular throughout, the granulation coarser on the inter-ocular area in the dry specimen; median eyes unusually large and near together, the distance between them only slightly exceeding their diameter, the eye-tubercle finely granular.

Tergites as in *capensis*.

Sternites.—Segments 1–4 granular only at the extreme lateral borders, segment 5 minutely granular throughout or smooth mesially.

Tail moderate, sparsely hairy, the vesicle pilose. Segments 1–5

of equal width (in the dry specimen), or segment 1 or 1 and 5 slightly wider than the others (in Thorell's type the tail becomes slightly narrower posteriorly); segment 5 almost as high as segment 4; vesicle about $\frac{4}{5}$ as wide as the fifth caudal segment.

Segments 1–3 with 10 granular crests, the superior and the upper lateral crests rather weak but generally distinct, the middle lateral crest very weak, sometimes indistinct, the infero-lateral and median crests rather weak in segment 1 but strong and well developed in segments 2–3, the infero-lateral crests in these 2 segments strongly converging posteriorly towards the adjacent median crests, which they almost touch at the hind ends of the segments, the 4 enlarged posterior granules of the 4 crests in segment 3 forming together a characteristic, transverse, broadly U-shaped crest with the upright bars of the U much shorter than its width. In segment 4 only the superior crests are developed, all the others being obliterated by the dense granulation which covers the sides and lower surface. In segment 5 the superior crest is distinct in the anterior fourth or fifth of the segment, the rounded superior edges of which are densely and finely granular like the sides, but provided, however, with a couple of larger granules representing the inner accessory crests of the upper surface; infero-lateral crests of segment 5 distinct, with 2–3 of the posterior teeth enlarged and lobe-like.

Segments 1–5 densely and finely granular on the sides and below, the granulation weak in the anterior, stronger in the posterior segments; under surface of segment 5 without distinct median or accessory crests.

Upper surface of all the caudal segments distinctly grooved along the middle, reticularly granular laterally but shagreened in the middle in segments 1–4, finely and weakly granular in the anterior but smooth in the posterior half of segment 5; from the anterior outer angles of the upper surface a row of granules extends obliquely backwards to meet the outer edge of the shagreened area, giving the latter a *broadly cuneate appearance* in most of the segments; posteriorly the shagreened area is constricted and then widened again at the hind edge in segments 1–2; upper surface of segment 1 about one-half longer than wide in the middle, the crests parallel or slightly converging posteriorly, the anterior edge descending rather suddenly but not quite perpendicularly in the middle.

Vesicle granular, especially at the base below.

Pedipalps in ♂.—Tibia $2\frac{2}{3}$–$2\frac{3}{4}$ times as long as wide, the anterior and posterior sides parallel in the middle third of the segment; the upper surface finely granular, its anterior crest obsolete or more

or less distinct. Hand about $1\frac{1}{3}$ times as wide as the tibia; fingers short, shorter even than in the type, the proportion of the length of the hand-back to the movable finger being 3 mm.: $3\frac{3}{4}$ mm. in the larger, $2\frac{3}{4}$ mm.: $3\frac{1}{9}$ mm. in the smaller spirit specimen, and 3 mm.: 3 mm. in the dry specimen. (In Thorell's typical ♀ $2\frac{4}{5}$ mm.: $4\frac{1}{2}$ mm.). Movable finger with 11 (rarely 10) anterior flanking teeth, the main rows in the middle third of this finger composed of 3–5 teeth (including the enlarged basal tooth of each row).

Pectines with 26–28 teeth in the ♂ (in Thorell's ♂ specimen 29–30, in his ♀ 24); the posterior basal lamella of the scape normal, not lobate in the ♂ (but produced into a broad lobe behind in the ♀, according to Thorell).

Measurements of largest ♂.—Total length 41; length and width of cephalothorax $4\frac{1}{2}$; distance of eyes from anterior margin 2, from posterior margin $2\frac{1}{3}$; length of femur of pedipalp 4, of tibia 4, of hand-back 3, of movable finger $3\frac{3}{4}$; width of femur 1, of tibia $1\frac{1}{3}$, of hand $1\frac{3}{4}$; length of tail 25, of first caudal segment $3\frac{1}{2}$, of second $3\frac{3}{4}$, of third $3\frac{5}{6}$, of fourth $4\frac{1}{2}$, of fifth $4\frac{4}{5}$, of sixth $4\frac{4}{5}$; width of first and fifth segments $2\frac{4}{5}$, of second, third, and fourth $2\frac{3}{4}$, of vesicle $2\frac{1}{4}$; height of fourth segment $2\frac{1}{4}$, of fifth $2\frac{1}{5}$; length of upper surface of first segment 2, width of this surface in its middle $1\frac{1}{2}$.

This remarkable species is well characterised by the converging inferior caudal crests of segments 2–3, the U-shaped transverse crest of segment 3, the absence of crests from the sides and under surface of segment 4, the large eyes and the short fingers. Its area of distribution, as far as known, includes German South-West Africa and Bushmanland, in the north-west corner of Cape Colony. Pocock has recently described a species under the name *P. cristatus*, in which the second, third, and fourth caudal segments show all the structures characteristic of *brevimanus*. No structural character whatever is mentioned in Pocock's diagnosis, which would distinguish this species from *brevimanus*, but as the locality is stated to be the Congo and the total length 62 mm. it would perhaps be unwise to assume that the species are necessarily identical.

4. Parabuthus lævifrons (Sim.).

1887. *Buthus l.*, E. Simon, Ann. Soc. ent. France (6), *v.* 7, p. 379. ♀.

1899. *Parabuthus l.*, Kraepelin, Das Tierreich, Scorp. and Pedip., p. 30.

The following description has been made from 3 ♂ with incras-

sated hands (apparently adults, measuring from 49 mm. to 68 mm. in length) and 2 ♀ (64 mm. and 84 mm. in length), all from Namaqualand Div., Cape Colony; also an immature ♂ and ♀, measuring 50 mm. and 44 mm. respectively, from Kenhart Div., Cape Colony.

♂ ♀. *Colour.*—Pale ochraceous; the legs paler sulphur-yellow; the abdomen sometimes slightly darkened; the last 3 caudal segments brown, in places sometimes almost black, the first 3 segments pale ochraceous; ocular tubercle black.

Cephalothorax about as long as broad, its length sometimes slightly exceeding, sometimes slightly less than, the breadth; extending from each side of the median eye-tubercle obliquely forwards and outwards nearly as far as the lateral eyes is a slightly depressed smooth area; the interocular area smooth and polished in the ♀, but granular in the ♂ (weakly granular in the young ♂ and ♀ from Kenhart Div.); rest of the cephalothorax rather finely granular; upper surface almost or quite destitute of hairs; median eye-tubercle quite smooth, broad, the eyes large, the distance between them about 2–2¼ times their diameter.

Tergites smooth or nearly so in the ♀ (minutely granular in the ♂) in the anterior part, more coarsely granular in the posterior part, of each of the first 6 segments; seventh segment thickly granular laterally, finely shagreened mesially.

Sternites 1–4 finely granular only at the extreme lateral borders; last segment with a few weak lateral granules, the keels often almost obsolete.

Tail comparatively long and slender, sparsely pilose, the segments gradually decreasing in width from the first to the sixth (♀) or from the second or third to the sixth, the first 2 or 3 segments being then equally wide (♂), the fourth always decidedly narrower than the first; segments 4 and 5 long and low, of almost equal height but sensibly lower than segments 1–3; width of vesicle $\frac{4}{5}$–$\frac{6}{7}$ that of fifth segment; aculeus very long, longer than the vesicle.

Segments 1–3 with 10 mostly coarsely granular keels, but the 4 inferior keels wholly smooth in segment 1 and smooth anteriorly in segment 2, the middle lateral keels also often smooth in the anterior part. Segment 4 with only 8 strongly developed keels, of which the infero-median ones are abbreviated posteriorly; the middle lateral keel in this segment rudimentary, represented at most by a smooth, barely perceptible ridge anteriorly and a few, mostly weak granules posteriorly. Superior crests in segments 2–4 sometimes with a slightly enlarged but not spiniform posterior tooth; this crest

in segment 4 very regular throughout, not interrupted in the middle; in segment 5 distinct and well developed only in the anterior fourth of the segment (and occasionally again quite posteriorly), the rest of the rounded, superior, outer edge more or less thickly covered with irregularly arranged granules, the superior accessory crests represented, much as in *capensis*, by an irregular row of low rounded granules, not distinctly demarcated from the rest. Inferior lateral crest in segment 5 with the teeth in the posterior half lobe-like and much enlarged.

Upper surface in anterior segments almost smooth or reticularly granular laterally, very finely and densely shagreened mesially, the upper surface in the posterior segments smooth. Segment 1 flattened above, not grooved mesially, its upper surface considerably longer than wide, with parallel crests, its length a little exceeding twice the width of the shagreened area and about equal to the width of the vesicle; the shagreened area large, narrower than in *capensis*, almost flat or very slightly concave, occupying in its widest part almost or quite half the width of the upper surface, constricted posteriorly, then widening again; upper surface descending suddenly (but not quite so perpendicularly as in *capensis*) along the anterior edge of the shagreened area, which projects slightly forwards at the middle. Segment 2 less flattened above, especially posteriorly, its upper surface one-half longer than wide and about four times as long as the width of the shagreened area, with parallel crests; the shagreened area moderately concave, especially anteriorly, constricted posteriorly, then widened again, longer and narrower than in segment 1, occupying in its widest part only about $\frac{1}{3}$ of the width of the upper surface; upper surface descending nearly as abruptly as in segment 1 in its mesial part along the anterior edge of the shagreened area. Segments 3–5 deeply grooved mesially, the groove finely granular in segment 3 and sometimes also in segment 4, but smooth in segment 5.

Upper part of lateral surface more or less finely granular in segments 1–3, the rest of the lateral and the inferior surface smooth between the keels in these segments; segment 4 granular posteriorly, but smooth anteriorly on the sides and below; ventral surface of segment 5 with a number of minute and some coarse conical granules, which do not, however, form defined secondary crests, the median crest strong, formed of a row of coarse conical granules; sides of segment 5 smooth along the middle, but with some large and small granules along the lower part.

Pedipalps.—Tibia thick, its anterior side strongly prominent, its

length along upper side just about double its width at base of large anterior tooth; the posterior surface and generally also the posterior part of the upper surface quite smooth; the rest of the superior surface finely but often weakly granular, with well-developed anterior crest.

Hand stout and strongly convex anteriorly in both sexes, its width slightly exceeding that of the tibia in the ♀ and young ♂ but considerably exceeding it (by about one-third) in the ad. ♂; the length of the tibia, therefore, sub-equal to (or slightly exceeding) twice the width of the hand in the ♀ and young ♂, and a little more than $1\frac{1}{2}$ times this width in the ad. ♂. Length of movable finger in ♀ about $1\frac{2}{3}$, in ad. ♂ about $1\frac{1}{3}$ times the length of the hand-back; this finger normally with 12–13, rarely only 11, anterior flanking teeth, the main rows in the middle third of the finger composed of 4–7 teeth (including the enlarged basal tooth of each row); in the oblique rows of 3 enlarged teeth on both fingers the anterior tooth is distinctly distal to the line joining the middle and posterior one in the ♂, but to a lesser extent (sometimes scarcely at all) in the ♀.

Legs.—Femora weakly granular externally, tibiæ smooth, sometimes very weakly granular in ♂.

Pectines with 33–35 teeth in the ♀ and 39–41 teeth in the ♂, the posterior basal lamella of the scape enlarged and produced into a broad lobe behind in the ♀, normal in the ♂.

Measurements of largest ♀.—Total length 84; length of cephalothorax 10, width 10; distance of eyes from anterior edge 4, from posterior edge $5\frac{1}{2}$; length of femur of pedipalp 7, of tibia $7\frac{1}{2}$, of hand-back 4, of movable finger 8; width of femur $2\frac{1}{4}$, of tibia $3\frac{1}{2}$, of hand 4; length of tail 52; length and width of first caudal segment 7, $5\frac{1}{5}$, of second $7\frac{3}{4}$, $5\frac{1}{5}$, of third 8, $5\frac{3}{4}$, of fourth $8\frac{1}{2}$, $5\frac{1}{5}$, of fifth $9\frac{3}{4}$, $5\frac{1}{5}$, of sixth 10, $4\frac{2}{3}$; height of first segment $4\frac{1}{3}$, of third 5, of fourth $4\frac{1}{3}$, of fifth $4\frac{1}{4}$; length of upper surface of first segment $4\frac{1}{3}$, width of this surface in its middle $3\frac{1}{2}$.

Of largest ♂.—Total length 68; length and width of cephalothorax $7\frac{1}{2}$; distance of eyes from anterior edge $2\frac{1}{3}$, from posterior edge 4; length of femur of pedipalp $5\frac{1}{2}$, of tibia 6, of hand-back nearly 5, of movable finger $6\frac{1}{2}$; width of femur $1\frac{1}{3}$, of tibia almost 3, of hand 4; length and width of first caudal segment $5\frac{1}{3}$, $4\frac{3}{4}$, of second 6, $4\frac{3}{4}$, of third $6\frac{1}{4}$, $4\frac{2}{3}$, of fourth 7, $4\frac{1}{4}$, of fifth $7\frac{3}{4}$, 4, of sixth $8\frac{1}{4}$, 3; height of first 3 segments $3\frac{1}{3}$, of fourth $3\frac{2}{3}$, of fifth $3\frac{1}{2}$; length of upper surface of first segment $3\frac{3}{4}$, width of this surface in its middle $2\frac{1}{3}$.

Localities.—Namaqualand Div., Cape Colony:—

(*a*) 1 ♀ from Henkries and 2 ad. ♂ (including the largest) found between Henkries and Wolftoon in Little Bushmanland (*Max Schlechter*).

(*b*) 1 ad. ♂ from Naroep, Great Bushmanland (*Max Schlechter*).

(*c*) 1 ♀ (the largest) from Naramoep, Great Bushmanland (*Max Schlechter*).

Kenhart Div., Cape Colony :—

(*d*) 1 juv. ♀ from Beenbreek on the Orange River, Great Bushmanland (*Max Schlechter*).

(*e*) 1 juv. ♂ from Pofadder, Great Bushmanland (*E. G. Alston*).

This species is not known to occur south of Bushmanland in Cape Colony. Simon's type-specimen, which was obtained by Dr. Hans Schinz in German South-West Africa, is evidently a ♀, although described as a ♂ ; its colour is much darker, the caudal segments are subequal in width, and the legs are quite smooth.

The stout hand and tibia of the pedipalps, the elongated tail with the middle lateral crest obsolete on the fourth segment, the smooth interocular area in the ♀, &c., characterise this species very sharply.

5. Parabuthus neglectus Purc.

1899. *P. n.*, Purcell, Ann. S. Afr. Mus., *v.* 1, p. 433.

♂ ♀.—*Colour* as in *capensis*, except that the vesicle is generally slightly darker than the other caudal segments.

Cephalothorax as in *capensis*, except that the anterior half of the upper surface is generally (but not always) provided with a number of hairs ; the eye-tubercle sometimes smooth in the groove above.

Tergites and *sternites* as in *capensis*.

Tail rather hairy. Relative width and height of segments 1–6 exactly as given in the description of *capensis*. Crests of segments 1–4 as in *capensis*, except that the superior crest in segment 4 is much more strongly dislocated in its middle, the anterior part being often continued backwards on the outer side of the uppermost portion for a short distance or even along the whole length of the latter. Superior crests of segment 5 as in *capensis*, except that the accessory crests are more distinct, one or more of the granules which compose it being strongly conical and, especially the posteriormost one, often sharply pointed and tooth-like ; lateral inferior crests of segment 5 with the posterior teeth enlarged and lobe-like.

Upper surface of caudal segments in most respects exactly agreeing with the description of *capensis*, the differences being (1) the anterior edge of the shagreened area projects convexly forwards in

the middle in segment 2 as well as in segment 1, (2) the shagreened area in segment 2 is broadly and somewhat deeply excavated in its anterior two-thirds, (3) the posterior edge of segment 2 is *strongly elevated and curved forwards* in the middle above, forming a very characteristic tongue-like elevation, also developed although less strongly in segment 3.

Lateral and under surfaces densely and in the posterior segments coarsely granular between the keels, except in the anterior part of segments 1-3 where they are more or less smooth; granulation on under side of segment 5 coarser than in *capensis*, very uneven, the larger granules strong and conical but not forming distinct secondary crests, the median crest as in *capensis*. Vesicle coarsely granular below and on the sides.

Pedipalps.—Tibia stout, its anterior side strongly prominent a little proximal to the middle; length of tibia along upper side in the ♀ $2\frac{1}{6}$–$2\frac{1}{4}$, in the ad. ♂ $2\frac{1}{4}$–$2\frac{1}{3}$ times its width at the base of the large anterior tooth; upper surface finely granular, with its anterior crest obsolete or only partially developed; the posterior surface smooth or nearly so.

Hand stout, its width somewhat exceeding that of the tibia in the ♀ and juv. ♂ and considerably exceeding it (by about one-third) in the ad. ♂; the length of the tibia sub-equalling (or slightly exceeding) twice the width of the hand in the ♀ and nearly or quite $1\frac{2}{3}$ times this width in the ad. ♂. Length of movable finger in ♀ $1\frac{3}{4}$–$1\frac{5}{6}$, in the ad. ♂ $1\frac{1}{3}$–$1\frac{1}{2}$ times as long as the hand-back. In not quite adult males the hand is scarcely thicker than in the ♀. Movable finger with 13 (rarely 12 or 14) anterior flanking teeth, the main rows in the middle third of the finger composed of 4–7 teeth (including the enlarged basal tooth of each row).

Legs.—External surface of femora and tibiæ finely granular, or the tibiæ nearly smooth.

Pectines with 32–36 teeth in the ♀ and 34–39 in the ♂, the posterior basal lamella of scape produced into a broad lobe behind in the ♀, merely angular in the ♂.

Measurements of a ♀.—Total length 91; length of cephalothorax $9\frac{1}{2}$, width 10; distance of eyes from anterior margin 4, from posterior margin $4\frac{3}{4}$; length of femur of pedipalp $6\frac{1}{2}$, of tibia 7, of hand-back $4\frac{1}{4}$, of movable finger $8\frac{1}{3}$; width of femur $2\frac{1}{2}$, of tibia $3\frac{1}{5}$, of hand $3\frac{1}{2}$; length of tail $52\frac{1}{2}$; length and width of first caudal segment $6\frac{2}{3}$, $6\frac{2}{3}$, of second $7\frac{3}{4}$, $6\frac{2}{3}$, of third $7\frac{3}{4}$, $6\frac{2}{3}$, of fourth $8\frac{1}{5}$, $6\frac{1}{2}$, of fifth 10, $5\frac{3}{4}$, of sixth $9\frac{1}{5}$, 5; height of fourth segment $5\frac{1}{3}$, of fifth (not including superior teeth) $4\frac{3}{4}$; length and width of upper surface of first segment $4\frac{1}{3}$.

Of a ♂.—Total length 73; length of cephalothorax $7\frac{3}{4}$, width 8; distance of eyes from anterior margin $3\frac{1}{4}$, from posterior margin 4; length of femur of pedipalp $6\frac{1}{4}$, of tibia $6\frac{1}{2}$, of hand-back 5, of movable finger 7; width of femur 2, of tibia $2\frac{2}{3}$, of hand $3\frac{1}{3}$; length tail $45\frac{1}{2}$; length and width of first caudal segment $5\frac{3}{4}$, $5\frac{3}{4}$, of second, $6\frac{1}{4}$, $5\frac{1}{5}$, of third $6\frac{1}{2}$, $5\frac{1}{5}$, of fourth $7\frac{1}{3}$, $5\frac{2}{3}$, of fifth $8\frac{1}{4}$, 5, of sixth 9, $4\frac{1}{4}$; height of fourth segment $4\frac{3}{4}$, of fifth (not including superior teeth) $4\frac{1}{2}$; length and width of upper surface of first segment $3\frac{3}{4}$.

Locality.—The above description has been taken from 18 ♀ (about 9 ad.) and 14 ♂ (3 ad.) from Clanwilliam and Calvinia Div. (collected by Mr. Max Schlechter on the road between Pakhuis Berg and Oorlogs Kloof).

In addition to these the Museum possesses a number of other specimens from the western Divs. of Cape Colony, making a total of 118 specimens in all, which agree with the above description in almost every respect. The largest ♂ and ♀ (from Concordia, *J. H. C. Krapohl*) measured 86 mm. and 111 mm. respectively. The pectinal teeth vary from 32–37 in the ♀ and from 34–41 in the ♂. Occasionally the posterior surface of the tibia of the pedipalp is finely granular. The movable finger has normally 13 anterior flanking teeth, varying in some specimens to 12 or 14.

The additional localities are:—

(*b*) Tulbagh Div. — 1 ♀ from Waterfall Mountains, near Tulbagh Road Station (*J. P. Cregoe*); 1 ♀ and 1 juv. from Piquetberg Road Station (*R. M. Lightfoot*).

(*c*) Worcester Division.—1 juv. from Touws River Station (*W. F. Purcell*).

(*d*) Clanwilliam Division.—3 ad. ♂, 1 ♀ and 9 juv. from Olijvenbosch Kraal and Onder Berg Vlei in the valley of the Berg Vlei River, north of the Piquetberg Range (*C. L. Leipoldt*); 1 ex. from Blikhuis, south of Clanwilliam, 1 ♀ from Keurbosch Kraal and 1 ad. ♂ from near Pakhuisberg, both in the Cedar Mountains (*R. M. Lightfoot*); 1 juv. from Rondegat, south of Clanwilliam, and 6 juv. from Boontjes River, near Pakhuis Berg (*Max Schlechter*).

(*e*) Calvinia Division.—2 ad. ♂, 2 ♀ and 3 juv. from Nieuwoudtville and elsewhere in the Onder Bokkeveld (*Max Schlechter, C. L. Leipoldt*).

(*f*) Namaqualand Division. — 7 ad. ♂, 9 ♀, and 24 juv. from Garies, Concordia, Ookiep, Steinkopf, and Hartebeest Fontein (*L. Péringuey, W. H. Turle, M. Schlechter, L. Mally, Dr. R. H. Howard, J. H. C. Krapohl*). These include much the largest specimens in the Collection. In some the lateral surface of the fifth

caudal segment is less thickly granular than usual, being sparsely granular, or even occasionally almost smooth, along the middle.

(*g*) 1 ad. ♂ from Agennys, Great Bushmanland, Namaqualand Division (*M. Schlechter*), differing from all the other specimens in having the first 3 caudal segments pale ochraceous and the last 3 segments brown. The movable finger is rather short, being only $1\frac{1}{4}$ times the length of hand-back.

(*h*) 1 ♀ (half-grown) from Great Namaqualand, German South-West Africa (*Dr. R. Marloth*), with the superior surface of tibia of pedipalp almost smooth, except along anterior margin.

The head-quarters of this species in Cape Colony appear to be in Clanwilliam Division, the western part of Calvinia Division, and the higher mountainous parts of Namaqualand Division, all of which tracts are very dry but have winter rains. Southwards the species extends into the territory of *P. capensis* in the Divisions of Tulbagh and Worcester, where, however, only a few isolated specimens have as yet been found. Northwards it extends into Great Bushmanland, where it is very rare indeed, being here replaced by *villosus*, *schlechteri*, &c.

P. neglectus is a very distinct species, and is easily recognisable by the tongue-like elevation on the second and third caudal segments, the very large shagreened area on the first and second segments, and the stout tibia of the pedipalp.

The Museum also possesses two apparently immature specimens, which are almost entirely black or brownish black in colour, only the tarsi and fingers being pale. These were found by Mr. C. L. Leipoldt at Onder Berg Vlei, together with a number of typical yellow specimens of *neglectus* (see above under *d*). Except that the tail is slightly narrower than is the case in yellow specimens of the same size, these black specimens do not appear to differ structurally from *neglectus*.

6. Parabuthus villosus (Peters).

1863. *Prionurus v.*, Peters, Monatsber. Ak. Berlin, 1862, p. 26.

1877. *Buthus v.*, Thorell, Atti Soc. ital., *v.* 19, p. 103.

1889. *Buthus v.*, Pocock, Ann. Mag. N. H. (6) *v.* 3, p. 343.

1895. *Parabuthus v.*, Pocock, J. Linn. Soc., *v.* 25, p. 316, pl. 9, figs. 6a, 6b.

1899. *Parabuthus v.*, Kraepelin, Das Tierr., Scorp. & Pedip., p. 31.

The following description was made from 15 specimens from

Naroep, but it applies equally well to the other examples from Bushmanland enumerated below.

♂ ♀. *Colour*, including that of under surface, varying from a rich dark brown to black or greenish black, the fingers and also often the manus of pedipalps and the distal parts of the legs lighter brown; third sternite of abdomen generally with a wide, triangular, pallid mark.

Pubescence generally dense on the limbs, the sides and under surface of tail, the hind margins of the abdominal tergites, and the surface of the last abdominal sternite; the hairs reddish yellow, particularly long on the tail but short and velvety on the fingers of the pedipalps.

Cephalothorax more depressed and relatively wider than in the other species of the genus; the granulation of the upper surface dense, especially coarse in the large specimens, the oblique depressed area on each side of the median eye-tubercle well marked, with much finer and, especially in the ♀, sparser granulation; median eye-tubercle broad, granular before and behind and generally also in the groove above, the eyes small, their distance apart at least 3 and often nearly 4 times their diameter.

Tergites 1–6 finely granular in their anterior, more coarsely granular in their posterior part; segment 7 coarsely granular laterally but broadly shagreened mesially.

Sternites.—Segment 1 finely granular laterally but smooth mesially in ♀ and juv. ♂, finely granular throughout or more or less smooth behind in the middle in the ad. ♂; segments 2–5 granular at lateral and especially at lateral anterior borders in the ♀, more extensively granular laterally and sometimes also very minutely granular mesially in the ad. ♂; last segment granular laterally and, in the ♂, sometimes also mesially.

Tail stout, the segments successively and regularly decreasing in width from the first to the fifth, the first always considerably wider than the fourth; fifth segment high, the first intermediate in height between the fourth and the fifth (not including the superior teeth) or equal to the fourth; vesicle very large, its width from $\frac{4}{5}$ to almost equal that of the fifth segment at the widest part of the latter, the posterior part of this segment being generally equal to, but sometimes slightly greater or less than the vesicle in width.

Segments 1–4 with 10 strong granular keels, those on the under side of segment 1 generally more or less smooth anteriorly, the infero-median keels of segment 4 abbreviated posteriorly and often irregular and scarcely distinguishable in the coarse granulation of the under

surface. The superior crests mostly with an enlarged and often sharply pointed posterior tooth; superior crests of segment 4 sometimes single and continuous throughout, but generally more or less distinctly duplicated in its posterior half, the double crests very close together; superior crests in segment 5 strong and continuous throughout the whole length of the segment, sometimes slightly weaker in the middle, the accessory superior crest very distinct, composed of 2–4 large, sharp, conical teeth. Teeth of infero-lateral crests in segment 5 often scarcely or not at all enlarged posteriorly.

Upper surface in all the segments reticularly raised, but otherwise smooth laterally (except for a couple of isolated granules in segment 1) but finely shagreened mesially in the anterior and smooth in the posterior segments. Upper surface of segment 1 flattened, or very slightly hollowed out from side to side posteriorly, not grooved mesially, a little longer than wide in the middle, the crests subparallel or slightly converging posteriorly; the shagreened area very large, almost flat or only slightly concave, occupying at its widest part slightly more than half the width of the upper surface, constricted posteriorly and then widening again, its length almost exactly equal to twice its greatest width; anterior edge of shagreened area projecting a little forwards in the middle, not so broad as in *capensis*, being somewhat less than half the width of the upper surface, which descends suddenly and perpendicularly along this edge. Segment 2 with the upper surface flattened laterally but provided in its anterior two-thirds with a deep, oval, shagreened depression; the shagreened area occupying only about $\frac{1}{3}$ of the width of the upper surface, 2–3 times as long as wide, quite absent from the posterior third of the upper surface, which is slightly depressed but not mesially grooved posteriorly; anterior edge descending suddenly and perpendicularly or nearly so in the middle. Segments 3–5 mesially grooved, the groove finely granular anteriorly in segment 3, smooth in segment 5.

Sides and under surface sparsely granular in the anterior and more densely and coarsely granular in the posterior caudal segments; under surface of segment 5 densely and very coarsely granular throughout, the median and accessory crests being mostly entirely indistinguishable; the sides of segment 5 granular throughout or more or less smooth in the upper part; vesicle coarsely granular below.

Pedipalps.—Upper surface of tibia almost smooth, with the anterior crest indistinct or absent; the anterior side of tibia rather prominent, especially in the ad. ♂, the length along the upper side in the ♀ $2\frac{2}{5}$–$2\frac{3}{7}$, in the ad. ♂ $2\frac{1}{6}$–$2\frac{1}{3}$ times its width.

Hand in the ♀ and juv. ♂ rather slender, its width less than that of the tibia in the ♀ and equalling it in the juv. ♂, but stout and about $1\frac{1}{4}$–$1\frac{1}{3}$ times the width of the tibia in the ad. ♂. Length of movable finger in the ♀ about $2\frac{1}{5}$, in the nearly mature ♂ nearly twice, and in the ad. ♂ only about $1\frac{1}{2}$ times as long as the hand-back; the movable finger with generally 15 but often only 14 anterior flanking teeth; the main rows in the middle third of the fingers composed of 5–7 teeth (including the enlarged tooth at the base of each row).

Legs finely granular externally, or the tibiæ almost smooth.

Pectines.—No. of pect. teeth in ♀ 36–41, in ♂ 38–42; posterior basal lamella of scape produced into a broad lobe behind in the ♀, normal in the ♂.

Measurements of largest ♀.—Total length 128; length of cephalothorax 15, width 18; distance of eyes from anterior margin $6\frac{3}{4}$, from posterior margin 8; length of femur of pedipalp $11\frac{3}{4}$, of tibia 12, of hand-back $6\frac{1}{2}$, of movable finger $14\frac{1}{2}$; width of femur 4, of tibia 5, of hand $4\frac{2}{3}$; length of tail 79; length and width of first caudal segment $10\frac{1}{4}$, 10, of second $11\frac{1}{2}$, $9\frac{3}{4}$, of third $11\frac{1}{2}$, $9\frac{1}{3}$, of fourth $12\frac{1}{4}$, 9, of fifth $14\frac{1}{4}$, $8\frac{2}{3}$, of sixth 15, $8\frac{1}{2}$; height of fourth segment $7\frac{1}{2}$, of fifth (not including superior teeth) $7\frac{1}{4}$; length of upper surface in first segment $6\frac{1}{2}$, width of this surface in its middle 6.

Of largest ♂.—Total length 108; length of cephalothorax 13, width $14\frac{3}{4}$; distance of eyes from anterior margin $5\frac{2}{3}$, from posterior margin $6\frac{2}{3}$; length of femur of pedipalp $10\frac{1}{4}$, of tibia $10\frac{3}{4}$, of hand-back 7, of movable finger $11\frac{3}{4}$; width of femur $3\frac{1}{2}$, of tibia $4\frac{1}{5}$, of hand 6; length of tail 68; length and width of first caudal segment 9, $9\frac{1}{3}$, of second 10, 9, of third 10, $8\frac{1}{5}$, of fourth 11, $8\frac{1}{3}$, of fifth 12, 8, of sixth $12\frac{1}{5}$, 7; height of fourth segment $7\frac{1}{2}$, of fifth (not including superior teeth) 7; length of upper surface of first segment 6, width of this surface in its middle $5\frac{1}{3}$.

Localities in Cape Colony.—(*a*) 10 ♂ (8 ad.) and 5 ♀ (varying from 92–128mm. in length) from Naroep, Great Bushmanland, Namaqualand Div. (*Max Schlechter*). The ad. ♂ (with incrassated hands) measured from 92–108mm. in length, while the largest immature ♂ (with slender hands) was 94mm. long.

(*b*) 1 juv. ♂ from Ramonds Drift on the Orange River, Little Bushmanland, Namaqualand Div. (*Max Schlechter*).

(*c*) 1 large immature ♂ (100mm. long) from Beenbreek on the Orange River, Great Bushmanland, Kenhart Div. (*M. Schlechter*).

(*d*) An ad. ♂ and ♀ from Pella, Great Bushmanland, Kenhart Div. (*Max Schlechter*).

(*e*) A very young specimen from Namies, Great Bushmanland, Kenhart Div. (*M. Schlechter*); fingers and base of aculeus pale yellow.

In the Museum are also the following specimens from German South-West Africa:—

(*f*) 2 large ♀ stated to have come from Great Namaqualand (*Dr. R. Marloth*). Differ from the Bushmanland specimens in having the sides and under surface of the cauda more thickly granular (the distribution of the granulation closely resembling that of *neglectus*), the infero-median crest of segment 5 more or less distinct, the second caudal segment grooved mesially above, its shagreened area reaching to near hind margin, the movable finger with 16 anterior flanking teeth.

(*g*) 1 ad. ♂ (old dried specimen) labelled "Walfish Bay," Damaraland (*Carrington Wilmer*). Median crest of fifth caudal segment more or less distinct, shagreened area of second segment as in the Bushmanland specimens, hand very stout, 1½ times as wide as the tibia, movable finger with 16 anterior flanking teeth.

P. villosus is distributed along the west coast of Africa between the Congo and Benguela in the north (*teste* Pocock) and Bushmanland in Cape Colony in the south. In all specimens from this wide area the first caudal segment has been found to considerably exceed the fourth in width, this being the case in all our specimens, in Thorell's, and in Pocock's from the Congo and Benguela. This character may, therefore, be regarded as a constant one for the species, and to it may be added the uniformly dark colouration, the dense pubescence, and the very wide vesicle.

7. Parabuthus transvaalicus Purc.

1899. *P.t.*, Purcell, Ann. S. Afr. Mus., *v.* 1, p. 434.

♀. *Colour* dark olive-green to nearly black, the tail for the most part dark brown between the keels, the legs and pedipalps dark brown to nearly black, the fingers and the distal portions of the legs yellowish; ventral surface of abdomen much paler, yellowish or yellowish brown, the pectines pale yellow.

Cephalothorax much broader than long, densely and, in the large ♀, rather coarsely granular throughout, the anterior half of upper surface often with a number of hairs as in *neglectus*, the eye-tubercle of moderate size, granular, the superciliary ridges smooth, the eyes rather small, the distance between them 2–2½ times their diameter.

Tergites 1–6 densely and finely granular in the anterior, more coarsely granular in the posterior parts of the segments, segment 7 finely shagreened mesially between the inner keels, coarsely granular laterally.

Sternites as in the ♀ of *capensis*, the last segment granular laterally.

Tail stout, sparsely pilose; segments 1–4 subequal, or segments 1–3 increasing successively but very slightly in width, segment 4 slightly wider than segment 1; segment 5 high, segment 1 nearly as high as segment 4 but higher than segment 5; vesicle large, its width $\frac{4}{5}$ that of fifth segment.

Segments 1–4 with 10 very strong, coarsely granular crests, the infero-median crests smooth anteriorly in segment 1 but abbreviated or irregular posteriorly in segment 4, the middle lateral crest in segment 4 strong. Superior crests in segments 2–3 with an enlarged, sharply pointed, subspiniform, posterior tooth; these crests in segment 4 dislocated or more or less distinctly doubled in the middle, 2 or 3 of the posterior teeth much enlarged and subspiniform; superior crests in segment 5 as in *villosus*, distinct and strongly developed throughout, the accessory superior crest very conspicuous, composed of 2–3 very large, subspiniform, posterior teeth and 1–2 smaller anterior ones. Infero-lateral crests of segment 5 with 1 or 2 of the posterior teeth somewhat enlarged and lobe-like.

Upper surface in anterior segments somewhat reticularly granular laterally, densely shagreened mesially. Segment 1 less flat above than in *villosus*, lightly hollowed out from side to side, especially posteriorly, shallowly grooved mesially almost as deeply as in segments 2–4; the upper surface longer than wide in the middle; the superior crests distinctly converging posteriorly; the shagreened area moderately large, lightly concave throughout its length, which is about $2\frac{1}{3}$–$2\frac{3}{4}$ times its greatest width, the latter occupying about $\frac{2}{5}$ of the width of the upper surface; posteriorly the shagreened area is slightly constricted, then widened again, its anterior edge is narrow, and the upper surface descends less abruptly than in *capensis* and not quite perpendicularly. Segment 2 grooved mesially above throughout its length as deeply as in segments 3 and 4; the upper surface as long as or slightly longer than wide in its middle; the superior crests almost parallel; the shagreened area occupying the groove, almost as large as in segment 1 and similar in outline, reaching hind edge of the segment, its length $2\frac{1}{2}$–$2\frac{3}{4}$ times its width, which at the widest part occupies about $\frac{2}{3}$ of that of the upper surface; anterior edge as in segment 1. The superior groove finely granular

in segment 3, bordered on each side by a patch of rather coarse granulation in segment 4, smooth in segment 5.

Lateral and under surfaces of all the segments thickly and for the most part coarsely granular, especially in the posterior segments, segment 5 being thickly covered throughout at the sides and below with finer and coarser granules, the infero-median crest very distinct and regular in this segment, but the accessory crests not distinct vesicle coarsely granular below.

Pedipalps.—Femur finely granular above. Tibia moderate, its upper surface finely granular and with the anterior crest rudimentary but traceable, the posterior surface smooth, the length of tibia along upper side $2\frac{1}{2}$ times its width. Hand slender, its width slightly less than that of the tibia; length of movable finger about $2\frac{1}{3}$ times that of hand-back; movable finger with 16 anterior flanking teeth, the main rows in the middle third of the finger with 6–7 teeth (including the enlarged basal tooth of each row).

Pectines with 32–35 teeth, the posterior basal lamella of scape produced behind into a broad lobe in the ♀.

Legs.—Femora finely granular externally, tibiæ weakly granular or almost smooth.

Locality.—1 large and 4 smaller ♀ from the Transvaal, kindly lent to me for description by Dr. J. W. B. Gunning, of the Pretoria Museum. Two of these specimens are in the South African Museum.

Measurements of largest ♀.—Total length 92; length of cephalothorax $9\frac{2}{3}$, width 11; distance of eyes from anterior margin $4\frac{1}{5}$, from posterior margin 5; length of femur of pedipalp $7\frac{1}{4}$, of tibia $8\frac{1}{3}$, of hand-back $4\frac{2}{3}$, of movable finger 10; width of femur $2\frac{3}{4}$, of tibia $3\frac{1}{3}$, of hand $3\frac{1}{5}$; length of tail 53; length and width of first caudal segment 7, $7\frac{1}{2}$, of second $7\frac{2}{3}$, $7\frac{2}{3}$, of third $7\frac{3}{4}$, $7\frac{3}{4}$, of fourth $8\frac{2}{3}$, $7\frac{2}{3}$, of fifth $9\frac{1}{3}$, 7, of sixth $9\frac{1}{3}$, $5\frac{3}{4}$; height of first caudal segment 6, of fourth (not including superior teeth) $6\frac{1}{2}$, of fifth (not including superior teeth) $5\frac{1}{5}$; length of upper surface of first segment 4, width of this surface in its middle 4.

This species closely resembles *villosus* in general appearance and in the granulation of the tail, but it is much less densely hairy, and the posterior caudal segments are relatively much broader and shorter. It is evidently closely related to the following form.

8. Parabuthus schlechteri Purc.

1899. *P. s.*, Purcell, Ann. S. Afr. Mus., *v.* 1, p. 434.

The following description was made from 5 ad. ♂ and 3 ad. ♀, besides 1 juv. ♀ and 8 juv. ♂ of various sizes, all from Little and

Great Bushmanland, Cape Colony. Most of these were collected by Mr. Max Schlechter, after whom they have been named in recognition of his valuable services in collecting the rich scorpion-fauna of Bushmanland.

♂ ♀.—*Cephalothorax* broader than long, rather coarsely granular above, the granulation in the depressions which extend obliquely forwards and outwards from each side of the eye-tubercle much finer and generally sparser or even almost absent, especially in the ♀, the median groove also often sparsely granular or almost smooth in front of the eye-tubercle; the anterior half of the upper surface with or without a few conspicuous hairs; eye-tubercle wide, situated only a little before the middle of the cephalothorax, the anterior surface and the groove on the summit sparsely granular in the ♂ but generally smooth or almost smooth in the ♀, the eyes medium-sized, the distance between them from $2\frac{1}{4}$ to nearly 3 (in typical ♀ $3\frac{1}{2}$) times their diameter.

Tergites and *sternites* as in *capensis*, excepting that the granulation on the tergites is coarser.

Tail stout, sparsely pilose, the hairs long, most numerous on the vesicle; anterior segments successively increasing in width from the first to the third, the fourth segment stout, as wide as the third, and always decidedly wider than the first; segment 5 high, segment 1 intermediate between segments 4 and 5 in height; vesicle large, its width $\frac{3}{4}$–$\frac{6}{7}$ that of the widest part of segment 5.

Caudal keels very closely agreeing with the description of those of *transvaalicus;* the enlarged posterior teeth of the superior crests generally very strong, long and sharp, occasionally, however, all of them, including those of the fourth and fifth segments, obtuse and stunted; the superior crests in segment 4 generally merely dislocated and more or less indistinctly doubled for a short distance in its middle but not distinctly doubled throughout the whole posterior part; the superior crests in segment 5 sometimes weaker and slightly irregular, although always distinct, in the middle. Inferior lateral crests in segment 5 with the posterior teeth somewhat enlarged.

Upper caudal surfaces smooth laterally, finely shagreened mesially in the anterior segments. Segment 1 with the upper surface much as in *villosus*, being generally flat (or slightly hollowed out from side to side posteriorly) but not grooved mesially, this surface as long as or slightly longer than wide in its middle; the superior crests parallel or slightly converging posteriorly; the shagreened area moderately large, almost flat, only very slightly depressed, its length about 2–$2\frac{1}{4}$ times its greatest width, the latter occupying

about $\frac{1}{2}$ the width of the upper surface; posteriorly the shagreened area is constricted, and then slightly widened again at the hind margin; at its anterior edge the surface descends, as in *transvaalicus*, less abruptly than in *capensis* and not quite perpendicularly. Segment 2 with a moderately large oval excavation occupying only the anterior half of the upper surface, the posterior half of which is shallowly grooved along the middle and quite smooth; the shagreened area small, confined to the anterior concavity, about twice as long as wide, its length only half, its width $\frac{1}{4}$–$\frac{1}{3}$ times, that of the upper surface. Segment 3 grooved mesially above, the anterior half of the groove deeper and finely granular. Segments 4 and 5 grooved mesially, the groove smooth in segment 5, weakly and very finely granular or almost smooth in segment 4 and not bordered on each side by coarser granules.

Lateral surface in segment 1 granular in its upper part, the inferior surface of this segment smooth or nearly so between the keels; segments 2–3 almost smooth on the sides between the keels or provided with a few coarse granules (occasionally with some very minute and weak reticular granulation in addition), the inferior surface, however, generally more thickly granular between the median keels; segment 4 coarsely and rather thickly granular below, more sparsely granular, sometimes almost smooth, on the sides; segment 5 thickly covered below with fine and coarse granules, the median crest distinct, regularly uniseriate or irregularly granular, the accessory crests indistinct or partially developed; sides of the fifth segment sparsely and coarsely granular in the lower part but generally nearly smooth in the upper part, the surface sometimes with a very minute granulation in addition to the coarse granules. Vesicle coarsely and seriately granular below.

Pedipalps.—Femur finely granular above. Tibia finely granular above, the anterior crest of upper surface mostly distinct and well developed, sometimes weak and irregular, the length of tibia along upper side in the ♀ $2\frac{2}{3}$, in the ad. ♂ $2\frac{1}{2}$ times its width. Hand slender in the ♀ and juv. ♂, its width slightly less than that of the tibia, but stout and exceeding the tibia in width (by about $\frac{1}{4}$–$\frac{1}{6}$) in the ad. ♂; length of movable finger in ♀ $2\frac{1}{4}$–$2\frac{2}{3}$, in ad. ♂ $1\frac{3}{4}$–$1\frac{5}{6}$ times that of hand-back; movable finger with generally 14 but often with 15 anterior flanking teeth, the main rows in the middle third of the fingers with 5–8 teeth (including the enlarged basal tooth of each row).

Legs with the femora thickly and the tibiæ weakly granular externally.

Pectines with 39–45 teeth in the ♀ and 46–51 in the ♂ ; the posterior basal lamella of the scape produced into a broad lobe behind in the ♀ , normal in the ♂ .

Measurements of ♀ (type).—Total length 108; length of cephalothorax $11\frac{3}{4}$, width $12\frac{3}{4}$; distance of eyes from anterior margin 5, from posterior margin $5\frac{1}{2}$; length of femur of pedipalp 9, of tibia $9\frac{1}{4}$, of hand-back $4\frac{3}{4}$, of movable finger 11; width of femur 3, of tibia $3\frac{3}{4}$, of hand $3\frac{2}{3}$; length of tail 62; length and width of first caudal segment $7\frac{1}{3}$, 8, of second $8\frac{3}{4}$, $8\frac{1}{4}$, of third $9\frac{1}{3}$, $8\frac{1}{3}$, of fourth $10\frac{1}{2}$, $8\frac{1}{3}$, of fifth 12, $7\frac{1}{3}$, of sixth $11\frac{2}{3}$, $6\frac{3}{4}$; height of fourth segment $6\frac{2}{3}$, of fifth (not including superior teeth) $6\frac{1}{3}$; length of upper surface of first segment 5, width of this surface in its middle $4\frac{1}{3}$.

♂ (from same locality).—Total length 95; length of cephalothorax $10\frac{1}{4}$, width 12; distance of eyes from anterior margin $4\frac{2}{3}$, from posterior margin 5; length of femur of pedipalp 9, of tibia $9\frac{1}{4}$, of hand-back $5\frac{2}{3}$, of movable finger 10; width of femur $2\frac{3}{4}$, of tibia $3\frac{1}{2}$, of hand 4; length of tail 60; length and width of first caudal segment $7\frac{1}{3}$, $7\frac{2}{3}$, of second $8\frac{1}{3}$, 8, of third $8\frac{2}{3}$, $8\frac{1}{4}$, of fourth $10\frac{1}{3}$, $8\frac{1}{4}$, of fifth $11\frac{1}{2}$, 7, of sixth $11\frac{1}{3}$, $5\frac{2}{3}$; height of fourth segment $6\frac{1}{2}$, of fifth (not including superior teeth) 6; length of upper surface of first segment $4\frac{3}{4}$, width of this surface in its middle $4\frac{1}{4}$.

Distance of median eyes from anterior margin in another specimen $4\frac{3}{4}$, from posterior margin $4\frac{5}{6}$.

Localities.—(*a*) Little Bushmanland: 1 ad. ♀ (type) and 1 ad. ♂ from between Henkries and Wolftoon, Namaqualand Div. (*Max Schlechter*). Legs and pedipalps pale yellow; trunk brownish yellow; tail pale ochraceous, the terminal segments brownish yellow; cheliceræ not blackened.

(*b*) Great Bushmanland: 1 ad. ♀ and 2 juv. from Naroep, Namaqualand Div. (*Max Schlechter*); 1 ad. ♀ , 3 ad. ♂ and several juv. from Namies, Zwart Modder, Beenbreek, and Bladgrond, all in Kenhart Div. ((*Max Schlechter*); and 2 juv. from Pofadder, Kenhart Div. (*E. G. Alston*). These specimens differ considerably from the types in their darker colouration. The trunk is dark brown to greenish black, the tail yellowish brown to brown, the posterior segments and the vesicle darker brown to olive-green below (in young specimens the whole tail often dark olive-green), legs and pedipalps pale yellow, cheliceræ dark olive-green distally.

This species is closely allied to *transvaalicus*, from which it differs principally in having the surfaces of the tail much less thickly granular and the posterior caudal segments more incrassated. It is evidently also closely related to *raudus* (Simon) from German

South-West Africa, from which it appears to differ in having the first caudal segment not deeply grooved above along the middle.

9. Parabuthus granulatus (H. & E.)

1828. *Androctonus g.*, Hemprich & Ehrenberg, Symb. phys., Scorp., No. 10.

1887. *Buthus fulvipes*, Simon, Ann. Soc. ent. France (6), *v.* 7, p. 378.

1899. *Parabuthus granulatus*, Kraepelin, Das Tierreich, Scorp. and Pedip., p. 30.

The following description was made from 7 ♂ (5 ad. with incrassated hands) and 6 ♀ (2 or 3 ad.) from Port Nolloth, Steinkopf, and other places in the Div. of Namaqualand (exclusive of Bushmanland), Cape Colony (*L. Péringuey, Dr. R. H. Howard, W. H. Turle*).

♂ ♀. *Colour.*—Trunk and tail pale ochraceous to ochraceous brown, the posterior caudal segments scarcely, if at all, darker than the anterior ones; legs pale yellow; pedipalps pale yellow to ochraceous, finger sometimes darkened at base; cheliceræ not reticulated with black.

Cephalothorax much wider than long, densely and rather coarsely granular throughout, and devoid of conspicuous hairs on the upper surface; eye-tubercle situated before the middle, moderate in size, granular in the groove, the superciliary ridges smooth or weakly crenular, the eyes rather small, the distance between them about 2–2¼ times their diameter.

Tergites 1–6 each finely granular anteriorly, coarsely granular posteriorly; segment 7 finely shagreened mesially, coarsely granular laterally.

Sternites.—Segment 1 broadly granular laterally under the pectines, especially in the ad. ♂, in which the mesial part is smooth, or very minutely granular also; segments 2–4 granular at extreme lateral borders, and often also behind the spiracles, especially in the ♂, granular also before the spiracles in the ad. ♂; segment 5 more or less coarsely granular laterally in ♂, less granular in ♀, the 4 keels smooth or crenular.

Tail stout, almost hairless; segments 1–3 of equal width and wider than segment 4, or segments 2 and 3 equally wide and slightly wider than segments 1 and 4, segment 4 as wide as or slightly narrower than segment 1; segment 4 high, segment 5 rather low, segment 1 intermediate in height between segments 4 and 5;

vesicle small, its width only about $\frac{2}{3}$ that of the widest part of segment 5.

Segments 1–3 with 10, segment 4 with only 8, strong, coarsely granular keels; the infero-medial keels smooth or weakly crenular in segment 1, more or less abbreviated posteriorly in segment 4; the middle lateral crest in segment 4 rudimentary, except quite posteriorly, very much weaker than the adjacent lateral crests of the same segment; fifth segment often slightly dilated inferiorly, the infero-lateral crests with the teeth much enlarged and lobe-like in the posterior half of the segment; superior crests in segments 2–4 or 3–4 often with an enlarged but not sharply spiniform posterior tooth, these crests in segment 4 perfectly regularly uniseriate throughout, without trace of dislocation or duplication in the middle; the superior crests in segment 5 strong and distinct only in the anterior third or half of the segment, the rounded, superior, lateral edges being smooth or almost smooth posteriorly, but covered in the middle of the segment with low blunt granules, which are continuous with and resemble those on the lateral surfaces; there are no distinct inner accessory crests on the upper surface.

Upper surface of segment 1 not flat but hollowed out from side to side and deeply grooved mesially, not sharply demarcated anteriorly, where it slopes downwards evenly and gradually in the middle, the lateral parts of this surface with some coarse or fine granulation or nearly smooth, the crests slightly converging posteriorly; the shagreened area confined to the deep groove, narrow, occupying less than $\frac{1}{3}$ of the width of the upper surface, its length about 4 times its width. Upper surface in segments 2–5 smooth or sparsely granular laterally, deeply grooved mesially, the groove finely granular anteriorly but smooth posteriorly in segments 2–4, smooth in segment 5.

Anterior segments rather weakly and for the most part sparsely granular between the keels on the lateral and inferior surfaces, segment 1 being almost smooth below; segments 4–5 very densely covered with low, coarse, rounded granules on the whole of the lateral and inferior surfaces, the granulation even, especially on lower surface of segment 5, where there are no traces of accessory crests, the infero-median crest of this segment well developed, uniseriate or indistinctly biseriate.

Pedipalps.—Femur finely granular above. Tibia slender, its length in the ♀ $2\frac{3}{4}$ to nearly 3 times, in the ad. ♂ $2\frac{1}{2}$–$2\frac{3}{5}$ times its width; the upper surface finely granular or nearly smooth (the latter

being the case especially in the ♀), its anterior crest distinct, with a second, generally less distinct, parallel crest behind it. Hand smooth, but often with traces of a few weak granules anteriorly, slender, its width about equal to that of the tibia in the ♀ and immature ♂ , but stout and about $1\frac{2}{3}$ times the width of tibia in the ad. ♂ ; the length of movable finger in the ♀ about $2\frac{1}{6}$, in the ad. ♂ $1\frac{1}{2}$–$1\frac{3}{5}$ times the length of the hand-back ; movable finger with 16–17 anterior flanking teeth, the main rows in the middle third of the fingers composed of 6–9 teeth (including the enlarged basal one), the anterior flanking granule often situated considerably distal to the line joining the middle and posterior granule of the obliquely transverse rows of 3.

Pectines with 26–31 teeth in the ♀ and with 29–34 in the ♂ ; the posterior basal lamella of the scape *very similar in both sexes*, the posterior inner angle in the ♂ , although rounded, generally more prominent and the posterior edge somewhat longer than in the ♀ , the latter edge bearing 1 or at most 2 teeth, which are always elongate and occupy less than half of the posterior side; this lamella in the ♀ bearing 1 or no teeth, the basal pectinal tooth in this sex always strongly abbreviated and generally represented by a short conical or even spherical stump, scarcely distinct from the small fulcra at the bases of the teeth.

Measurements of ♀ .—Total length 91 ; length of cephalothorax $10\frac{2}{3}$, width 12 ; distance of eyes from anterior margin $4\frac{1}{4}$, from posterior margin $4\frac{3}{4}$; length of femur of pedipalp $8\frac{3}{4}$, of tibia 9, of hand-back 5, of movable finger $10\frac{1}{2}$; width of femur $2\frac{1}{3}$, of tibia $3\frac{1}{6}$, of hand $3\frac{1}{6}$; length of tail 59 ; length and width of first caudal segment $7\frac{3}{4}$, $7\frac{3}{4}$, of second $8\frac{1}{2}$, $7\frac{1}{3}$, of third $8\frac{1}{2}$, $7\frac{1}{3}$, of fourth 10, $7\frac{1}{2}$, of fifth $11\frac{3}{4}$, $6\frac{3}{4}$, of sixth $10\frac{1}{4}$, $4\frac{1}{4}$; height of fourth segment $6\frac{1}{4}$, of fifth $5\frac{1}{3}$.

♂ .—Total length 99 ; length of cephalothorax $10\frac{1}{4}$, width $11\frac{1}{2}$; distance of eyes from anterior margin 4, from posterior margin $5\frac{1}{2}$; length of femur of pedipalp 9, of tibia $9\frac{1}{2}$, of hand-back $6\frac{1}{4}$, of movable finger $10\frac{1}{3}$; width of femur $2\frac{1}{4}$, of tibia $3\frac{1}{3}$, of hand $4\frac{3}{4}$; length of tail 62 ; length and width of first caudal segment 8, 8, of second $8\frac{2}{3}$, $8\frac{1}{3}$, of third $8\frac{3}{4}$, $8\frac{1}{3}$, of fourth $10\frac{1}{3}$, 8, of fifth $12\frac{1}{3}$, 7, of sixth 11, $4\frac{1}{2}$; height of fourth segment 7, of fifth 6.

A darker variety, apparently identical in colouration with *P. fulvipes* (Sim.) and not differing in structure, except in some unimportant points, from the specimens just described, inhabits Great Bushmanland and adjacent districts to the east. In these the trunk is nearly always dark brown to almost black and generally with a greenish tinge, the posterior caudal segments often darker than the anterior

ones below, the pedipalps ochraceous-brown to blackish brown, the base of the fingers darker, the cheliceræ finely reticulated, the legs pale yellow as usual, but the femora at their apex and the tibiæ at their base often somewhat infuscated. The difference between the sexes is *well marked* by the structure of the pectines, as the posterior basal lamella of the scape is more angular at its inner hind corner in the ♂ and bears at least 2, often 3 teeth, which occupy at least half of the hind margin (in one juvenile ♂ from Naroep the basal tooth is also reduced to half its normal length). In the ♀ the lamella resembles that of the specimens already described above. Number of pectinal teeth in ♀ 27–31, in ♂ 31–36. Movable finger with 14–15 anterior flanking teeth. These specimens are the following:—

(*b*) 4 ad. ♂ and 2 juv. ♂ from Naroep, Great Bushmanland, Namaqualand Div. (*Max Schlechter*).

(*c*) 1 ad. ♂ from Namies, Great Bushmanland, Kenhart Div. (*Max Schlechter*).

(*d*) 1 ad. ♀ and 1 juv. ♀ from Bladgrond, Great Bushmanland, Kenhart Div. (*Max Schlechter*).

(*e*) 1 ad. ♀ from Upington on the Orange River, in Gordonia; the hand in this specimen reticularly and weakly granular anteriorly.

(*f*) 1 ad. ♂ and 1 juv. ♂ from Van Wyks Vlei, Carnarvon Div. (*E. G.* and *D. C. Alston*); the upper surface of the tail more or less minutely and reticularly granular laterally in all the segments.

The Museum also possesses specimens of *granulatus* from the following localities:—

(*g*) 1 ad. ♂ from Dunbrody, Uitenhage Div. (*Rev. J. A. O'Neil*); small specimen, 73 mm. long, the movable finger with 15 anterior flanking teeth.

(*h*) 1 ad. ♂ from the village of Clanwilliam (*C. L. Leipoldt*). This is much the largest specimen in the Collection, its measurements being: Total length 112; length of cephalothorax 12, of tail 70; length and width of first caudal segment $9\frac{1}{4}$, $9\frac{3}{4}$, of second $10\frac{1}{5}$, $10\frac{1}{5}$, of third $10\frac{1}{5}$, $10\frac{1}{5}$, of fourth $11\frac{2}{5}$, 10, of fifth $13\frac{4}{5}$, 9, of sixth $11\frac{1}{2}$, $5\frac{3}{4}$; height of fourth segment 9, of fifth 8. The fourth caudal segment is wider than the first, and the upper surface of segments four and five are more coarsely and densely granular in the lateral parts than is usually the case. Movable finger with 15 anterior flanking teeth.

(*i*) 2 ad. ♀ from Robertson Div. (*Dr. R. J. M. Melle*). Movable finger with 15–16 anterior flanking teeth.

(*j*) 1 ad. ♂, the locality of which is stated to be Wagenaars Kraal, Victoria West Div. (*Dr. C. S. Piers*). Movable finger with 14 anterior flanking teeth.

(*k*) 1 juv. ♀ from Great Namaqualand, German South-West Africa (*Dr. R. Marloth*). Movable finger with 14 anterior flanking teeth.

Distribution.—This species is not known to be common anywhere in Cape Colony, where its principal locality appears to be the whole of Namaqualand Division and Great Bushmanland. South of Namaqualand it is very rare indeed, but it appears to extend not only over the same area as *neglectus*, but considerably to the east of this as well.

P. granulatus is a very well defined species, its principal characters being the small vesicle, the rudimentary middle lateral crests on fourth caudal segment, the deep groove on first segment, the granulation of the surfaces and superior crests of fourth and fifth segments, the slender brachium, and the absence in the ♀ of a prominent posterior lobe on the basal lamella of the scape of the pectines. The sex of a specimen can often be determined with certainty only by means of the genital stylets.

P. fulvipes (Sim.), from German South-West Africa, is undoubtedly identical with this species, and closely agrees in colouration with specimens from Bushmanland, as does also Pocock's recently described subsp. *fuscus* from the Kalahari, in which, however, the patellæ as well as the femora of the legs are uniformly infuscated (Ann. Mag. N. H. (7), *v.* 7, p. 285, 1900). *P. pallidus* Poc. from Mombassa is apparently a very closely allied form.

I have been unable to identify with certainty the following South African forms from the specimens in the Museum :—

P. dilutus, Thorell (Atti Soc. ital., *v.* 19, p. 103, 1887). Described as a variety of *villosus* and differing from it in the yellow colouration and finer granulation. The exact locality of the type, which was preserved in the Museum at Stockholm, is unknown.

P. segnis, Thorell (loc. cit., p. 110). Described as a doubtful variety of *brevimanus* and doubtfully referred by later authors to *capensis* (H. and E.), but the identity of the two forms is very improbable, as the type of *segnis* in the Gothenburg Museum was obtained by C. J. Andersson, who collected in Damaraland and Ovampoland.

P. mosambicensis, Peters (Monatsb. Berlin. Ak., 1861, p. 516). It is highly improbable that this species, which was found by Peters at Tette on the Zambesi, can be identical with *capensis* (H. and E.).

P. raudus, Simon (Ann. Soc. Ent. Fr. (6), *v.* 7, p. 377, 1887). Found by Dr. H. Schinz in German South-West Africa, and closely allied to

schlechteri Purc., but the upper surface of the tail (and presumably of the first segment also) is said to be deeply grooved longitudinally.

P. flavidus, Pocock (Ann. Mag. N. H. (7) *v.* 3, p. 419, 1899). From Tangs (Taungs ?), Bechuanaland, and apparently closely related to *raudus* and *schlechteri*.

P. obscurus and *pachysoba*, Penther (Ann. Naturh. Hofmus. Wien., *v.* 15, pp. 154 and 155, 1900). These two forms do not apparently differ from *transvaalicus* Purc., as far as can be ascertained from Penther's descriptions, except in having a relatively shorter and stouter tail.

Gen. LYCHAS* C. L. Koch.

Lychas pegleri, n. sp.

♂ ♀. *Colour.*—Trunk blackish-brown to dark olive-green, variegated with yellow markings, the under surface, except posteriorly, pale; the first 6 abdominal tergites either almost entirely darkened or with the following principal yellow markings:—A median stripe, a longitudinal stripe near each lateral margin, an anterior transverse stripe joining these, a pair of >< marks, a pair of anterior oval spots (one on each side of the median line), a pair of short, transverse, lunate lines just behind the oval spots, besides a few other tiny dots scattered about; cephalothorax with the yellow markings very similar to those in *L. burdoi* (Sim.), the principal being a large spot behind each group of lateral eyes, a pair of curved lines closely embracing the dark olive-green median tubercle as in brackets, alongside these a pair of more lateral longitudinal lines converging posteriorly, 3 pairs of short obliquely transverse lines following in succession behind the median tubercle, the anteriormost running from the hind ends of the bracket-shaped marks outwards and forwards, the middle pair parallel to the anterior, but the posterior pair more transverse or even directed slightly backwards; on each side are also 2 large oblique stripes, and near the posterior margin is a broad two-horned area; near each lateral margin and often along the middle line is a narrow longitudinal stripe and at each anterior outer corner is a small V. Tail with an equal extent of yellow and infuscate markings or the latter predominating; segment 5 very slightly darker posteriorly than the other segments; vesicle infuscate, with yellow dots and stripes. Femur and tibia of pedipalps for the most part infuscate above, with yellow markings; the hand yellow, with infuscate longitudinal stripes and some veins,

* According to Pocock (P.Z.S., 1899, p. 834), this name should be substituted for *Archisometrus* Krpln.

the fingers deeply infuscate or black proximally, paler distally. Cheliceræ with a net-work of black. Legs infuscate, striped longitudinally with yellow.

Cephalothorax thickly granular.

Tergites thickly granular, the yellow markings mostly smooth, except the median ones; the segments with 3 distinct keels, the lateral keels granular, short, occupying about $\frac{1}{3}$ or $\frac{1}{4}$ of the length of the segment.

Sternites.—Segments 1–3 of abdomen smooth and polished, segment 3 in ♂ weakly granular at anterior corners, segment 4 smooth in middle, weakly granular laterally in ♀, more extensively granular laterally in ♂, segment 5 weakly granular throughout, with 4 feebly granular keels.

Tail.—Segments 1–2 with 10, segment 3 with 8–10 and segment 4 with 8 well defined granular keels, the middle lateral keel strong in segments 1 and 2, distinct or rudimentary in segment 3 and absent in segment 4, the superior keels with the terminal denticle only slightly enlarged; segment 5 with distinct superior, infero-lateral, and median crests. The caudal surfaces minutely granular between the keels, especially in segment 5; the upper surface in segments 1–4 with a cuneate, granular, median area bordered by 2 rows of larger granules, which converge posteriorly. Vesicle about $\frac{3}{4}$ as wide and $\frac{2}{3}$–$\frac{3}{4}$ as high as segment 5, weakly granular below and on the sides, the aculeus short, the tubercle below it small, cylindrical, blunt.

Pedipalps.—Femur granular above. Tibia granular anteriorly, smooth posteriorly, with a couple of irregular rows of granules on upper side. Hand stout, somewhat wider than the tibia in the ♀ and considerably wider in the ♂, rounded, not angular, finely granular anteriorly and at the base of the finger, weakly granular or nearly smooth on upper surface, smooth posteriorly; fingers short, about $1\frac{1}{3}$ times the length of the hand-back in the ♀, still shorter, about $1\frac{1}{5}$ times this length in the ♂; movable finger with 6–7 main rows and 7 anterior flanking granules, the enlarged proximal tooth in each main row flanked externally by 2 similar teeth.

Cheliceræ with only one inferior tooth on the immovable finger.

Legs granular externally on femur and tibia, the tarsal spur between the first and second joints on the third leg small, about $\frac{1}{6}$ of the length of the second tarsal segment.

Pectines with 11–12 teeth in both sexes, the basal tooth in the ♀ very much enlarged, both longer and much wider than the others, normal in the ♂.

Measurements of a ♀.—Total length 30½, length of tail 17, length of cephalothorax 3, length and width of fourth caudal segment 2·9, 1·6.

Locality.—Several ♂ and ♀ specimens from near Umtata, Cape Colony, collected by Miss Pegler and kindly sent to us by the Rev. Dr. F. Kolbe.

These are the first specimens of the genus recorded from South Africa. They differ apparently from all the other species of the genus in having two, instead of only one, external flanking teeth alongside of the enlarged basal tooth of each of the main rows on the fingers.

Gen. UROPLECTES Ptrs.

Uroplectes carinatus (Poc.).*

1890. *Lepreus c.*, Pocock, P. Zool. Soc. London, Mar., 1900, pp. 129–130, pl. 14, figs. 3, 3a.

1896. *Uroplectes c.*, Pocock, Ann. Mag. N. H. (6), v. 17, p. 380.

Distribution.—The area inhabited by this species, as the list of

* This and the three following species form a group of closely allied forms with the following common characters:—Abdominal tergites 3-keeled, fingers of pedipalps with 9 main rows of teeth, the enlarged basal tooth in the rows flanked on each side by a single large tooth, the inner flanking tooth always situated at the end of the next proximal row, vesicle with no tooth below aculeus, all the inferior caudal keels well developed in segments 1–4, hand rounded, not angular or flattened. The adults of these 4 species may be distinguished as follows:—

a. With a pair of minute stylets situated one on each side of the genital opening behind just under the posterior inner angles of the halves of the operculum when the latter is closed. *Males.*

  a^1. Fourth caudal segment $1\frac{5}{6}$–2 times as long as wide .. *U. carinatus* (Poc.)

  b^1. Fourth caudal segment $2\frac{1}{3}$ times as long as wide .. .. *U. alstoni*, n. sp.

  c^1. Fourth caudal segment $2\frac{3}{5}$ to nearly $2\frac{3}{4}$ times as long as wide *U. karrooicus*, n. sp.

b. Genital opening without stylets. *Females.*

  a^2. Fourth caudal segment $1\frac{1}{2}$–$1\frac{3}{4}$ times as long as wide; hand distinctly wider than tibia .. .. *U. carinatus* (Poc.)

  b^2. Fourth caudal segment $1\frac{6}{7}$–2 times as long as wide; hand distinctly wider than tibia .. .. *U. alstoni*, n. sp.

  c^2. Fourth caudal segment from slightly more than twice to $2\frac{1}{5}$ times as long as wide; hand slightly narrower than tibia .. .. *U. karrooicus*, n. sp.

  d^2. Fourth caudal segment $2\frac{1}{3}$ times as long as wide; hand as wide as or very slightly wider than tibia .. .. *U schlechteri*, n. sp.

localities given further on shows, comprises the western half of Cape Colony with the exception of the strip along the south coast, which is occupied principally by *U. lineatus*. It extends from the Divs. of Malmesbury, Tulbagh, Worcester and Prince Albert in the south to Bushmanland in the north, and it is more than probable that a form with such a distribution would extend some distance north of the Orange River as well. The locality of the type-specimen is given as "South Africa, near the tropic of Capricorn."

The South African Museum possesses 84 specimens of this species, of which the principal characters may be enumerated here, as Pocock's original description, although very detailed, was founded upon a single ♂ example.

♂ ♀. *Colour.*—Trunk and tail pale yellow to ochre-yellow, the trunk sometimes olivaceo-ochraceous; the legs pale yellow, generally blackened along upper and under edges; tail with at least the 5th segment (except quite posteriorly) and the inferior keels and generally also the other keels more or less infuscated; trunk with only the three groups of eyes blackened, or much more extensively infuscated, especially along the anterior edge and the middle line of cephalothorax and along 3–5 longitudinal stripes on abdomen; hand often striped with infuscate marks; vesicle pale yellow, with the aculeus dark reddish-brown distally.

Cephalothorax finely to somewhat coarsely granular throughout, sometimes with an oblique smooth area on each side between the median eye-tubercle and the lateral eyes in the ♀; often with a pair of distinct posterior keels composed of 2–4 granules, corresponding in position to the lateral keels on the tergites; eye-tubercle mostly entirely smooth along the groove but the crests often crenular before and behind (rarely also above), especially in the ♂.

Tergites 1–6 coarsely granular posteriorly in both sexes, but anteriorly each segment is very densely and minutely granular in the ♂ but smooth or almost so (rarely finely granular mesially) in the ♀; median and lateral crests very distinct, the latter short, represented by several granules in the posterior but by only 1 or 2 in the anterior segments and often absent in segment 1 or segments 1 and 2.

Sternites 1–4 smooth; segment 5 smooth, or granular laterally, provided with 4 more or less distinct, smooth or crenular keels.

Tail stout, 4th segment in the ad. ♂ $1\frac{5}{6}$–2, in the ad. ♀ $1\frac{1}{2}$–$1\frac{3}{4}$ times as long as wide;* the crests mostly denticulate but the 4

* All the measurements in this genus are taken in the same manner as those of *Parabuthus* as explained in foot-note on p. 145.

inferior ones often partially or wholly smooth in segment 1 and in the anterior part of segment 2 in both sexes; the terminal tooth of the superior crests in segments 1–3 and often also in segment 4, and of the superior lateral crests in segments 1–2 and sometimes also in segment 3, enlarged, stout and conical in the ♀, slenderer and often subspiniform in the ♂; the middle lateral crest strong and well developed in segments 1–3, complete in segment 1, slightly abbreviated anteriorly in segment 2, still more so in segment 3, in which it varies considerably in length, occupying from $\frac{1}{4}$ to over $\frac{3}{4}$ of the length of the segment, while in segment 4 it may be completely absent or more or less distinct and weak, represented by a row of larger granules, in a series of specimens from one and the same locality. Anterior caudal segments finely granular above but smooth below; the sides of segments 1–4 and the under surface of segments 3–4 generally finely granular (rarely almost smooth) in the ♀, but often quite smooth in the ♂ between the keels; upper surface of segment 5 in the ♀ entirely smooth or granular laterally, rarely also minutely granular mesially, in the ad. ♂ finely and densely granular throughout, except along the median line in the anterior half; the superior keels in segment 5 developed only in the anterior $\frac{1}{6}$–$\frac{1}{2}$ of the segment, the lateral surfaces densely and often coarsely granular or the inferior part smooth or nearly so, the inferior surface with coarse and fine granulation or the fine granulation absent, the coarse granules generally forming irregular accessory crests in the anterior half, the median crest generally distinct, rarely obsolete. Vesicle granular throughout, or smooth below and granular only on the sides and posteriorly below the aculeus, moderate or large in the ♀, smaller, rarely large, in the ♂.

Pedipalps.—Upper surface of tibia generally smooth (sometimes granular in the ♂), the anterior edge of this surface generally well defined and provided with a row or strip of granules; the anterior surface of tibia granular above. Hand smooth, except distally below, where it is frequently finely granular; its greatest width exceeding that of the tibia, especially in the ♂, the length of the tibia 2–2$\frac{1}{2}$ times the width of the hand in ad. ♂; movable finger in the ♂ short, provided at the base with a distinct or indistinct lobe, the immovable finger sinuate at the base; fingers with 9 main rows of teeth.

Pectines with 19–26 (according to Pocock up to 27) teeth, the basal tooth in the ♀ always similar to the rest of the teeth in all our specimens, the scape longer in the ♂ than in the ♀ but varying in length according to locality.

Size.—The length varies from 27–41mm. in the ad. ♂ and reaches 44mm. in the ♀.

Localities in Cape Colony.—In the following list the local variations in colour, thickness of tail, &c., are generally mentioned.

A. *Abdomen with at most* 3 *dorsal stripes; fifth caudal segment infuscated laterally only in the anterior* $\frac{2}{3}$ (*rarely* $\frac{3}{4}$) *of its length; cephalothorax without median longitudinal stripe.*

Beaufort West Div.—(*a*) 2 ♂ from round the village of Beaufort West (*W. F. Purcell*); cephalothorax infuscated along anterior border; abdomen with a fine black median line and a row of infuscate marks on each side above (a pair in the posterior part of each tergite); hand and tibia of pedipalp and the legs with infuscate stripes; fourth caudal segment $1\frac{7}{8}$ times as long as wide; vesicle almost smooth below, excepting behind below the aculeus. Total length of a ♂ $28\frac{1}{2}$; length of cephalothorax 3, of tail $17\frac{1}{4}$; length and width of first caudal segment 2·1, 1·7, of second 2·4, 1·6, of third 2·6, 1·6, of fourth 3, 1·6, of fifth 3·5, 1·6, of sixth 3, 1·3; length of tibia of pedipalp 3·2, of hand-back 1·8, of movable finger 3·2; width of tibia 1·1, of hand 1·4.

Fraserburg Div.—(*b*) 1 ♂ (dry) from the village of Fraserburg (*E. G. Alston*); fourth caudal segment twice as long as wide; otherwise resembling the specimens from Beaufort West.

Prince Albert Div.—(*c*) 1 ♂ and several juv. from near the village of Prince Albert (*W. F. Purcell*); anterior margin of cephalothorax and also the keels and coarser granules of the tergites blackened in the adult, but the lateral rows of infuscate marks on the tergites and the stripes on the hands absent or obsolete; fourth caudal segment twice as long as wide; vesicle as in (*a*).

Worcester Div.—(*d*) 1 ♀ and several juv. from Triangle (*R. M. Lightfoot*); colour as described under (*c*); fourth caudal segment $1\frac{2}{3}$ times as long as wide.

Namaqualand Div.—(*e*) 1 ♂ from near Naroep (between Naroep and Naap), Great Bushmanland (*Max Schlechter*); colour almost entirely pale yellow, only the 3 groups of eyes blackened and the inferior keels of tail and part of the fifth segment infuscated; crests of eye-tubercle entirely granular; fourth caudal segment and vesicle as in (*c*).

(*f*) 1 ♀ and juv. from Concordia (*J. H. C. Krapohl*); colour as described under (*a*).

Clanwilliam Div.—(*g*) 2 ♂ and a number of ♀ and juv. from Pakhuis (*R.* and *M. Schlechter, L. Mally*); colour as described under (*a*),

except that the legs and pedipalps are generally without infuscate marks; tail stouter than usual, the fourth segment in the ♂ $1\frac{5}{6}$, in the ♀ $1\frac{4}{7}$–$1\frac{3}{5}$ times as long as wide, the fifth segment more coarsely granular than usual, particularly on the sides and upper surface in the ♂; hands thicker than usual, the width in the ♂ equalling half the length of the tibia, the lobe on the movable finger strongly developed; vesicle distinctly granular below in both sexes. Measurements of a ♂ and ♀: Total length ♂ 30·5, ♀ 40; length of cephalothorax ♂ 3·2, ♀ 4·6, of tail ♂ 19, ♀ 25; length and width of first caudal segment ♂ 2·4, 1·8, ♀ 3, 2·9, of second ♂ 2·6, 1·8, ♀ 3·5, 2·8, of third ♂ 2·8, 1·8, ♀ 3·6, 2·7, of fourth ♂ 3·3, 1·8, ♀ 4·3, 2·7, of fifth ♂ 3·8, 1·8, ♀ 4·9, 2·7, of sixth ♂ 3·2, 1·4, ♀ 4·5, 2·5; length of tibia of pedipalp ♂ 3·2, ♀ 4·2, of hand-back ♂ 2·1, ♀ 2·5, of movable finger ♂ 3·2, ♀ 4·5; width of tibia ♂ 1·2, ♀ 1·6, of hand ♂ 1·6, ♀ 2.

(*h*) 1 ♀ and 1 juv. from Betjesfontein (*Miss M. Bergh*); resembling those from Pakhuis.

(*i*) 1 ♂ from the village of Clanwilliam (*R. M. Lightfoot* and *C. L. Leipoldt*); resembling those from Pakhuis but more blackened, especially on the legs and pedipalps.

B. *Much more strongly blackened; the abdomen with* 5 *dorsal longitudinal stripes, viz., a median stripe* (*continued over cephalothorax to the anterior margin*), *a stripe on each side along lateral margin and another stripe on each side at a little distance from lateral margin; fifth caudal segment more extensively blackened, generally with only* $\frac{1}{5}$–$\frac{1}{6}$, *rarely as much as* $\frac{1}{4}$, *of the length on the sides yellow posteriorly; legs generally blackened along the edges; vesicle always distinctly granular below.*

Clanwilliam Div.—(*j*) 4 ♂ and a number of ♀ and juv. from Sneeuwkop in the Cedar Mountains (5,000–6,000 feet, *R. Pattison*); pedipalps not infuscated; tail and hands slenderer than in the specimens from Pakhuis; fourth caudal segment twice as long as wide in ♂ and $1\frac{2}{3}$ times in ♀; length of tibia $2\frac{1}{4}$–$2\frac{1}{3}$ times the width of hand in ♂.

(*k*) 2 ♂ from Kakadouw Pass, Cedar Mountains (1,000–3,000 feet, *R. Pattison, C. L. Leipoldt*); pedipalps not infuscated; fourth caudal segment $1\frac{5}{6}$–$1\frac{7}{8}$ times as long as wide; length of tibia $2\frac{1}{5}$–$2\frac{1}{6}$ times the width of hand.

(*l*) 1 ♀ from Boschkloof, Cedar Mountains (*R. Pattison*); pedipalps not infuscated; fourth caudal segment $1\frac{3}{5}$ times as long as wide.

(*m*) Several ♀ and juv. from Boontjes River, near Pakhuis

(*R.* and *M. Schlechter, L. Mally*); pedipalps somewhat infuscated; fourth caudal segment $1\frac{3}{4}$ times as long as wide.

(*n*) 1 ♀ and 1 juv. from Onder Berg Vlei in the valley of the Berg Vlei River, north of the Piquetberg Range (*C. L. Leipoldt*); pedipalps, tergites, tail and legs ferruginous-yellow and mostly with ferruginous markings in addition to the infuscate markings.

Malmesbury Div.—(*o*) A very young specimen from near the village (*R. M. Lightfoot*), apparently belonging to this species.

Piquetberg Div.—(*p*) 1 ♀ and 1 juv. from Gutverwacht Mission Station; pedipalps with infuscate stripes; fourth caudal segment $1\frac{1}{2}$ times as long as wide.

Tulbagh Div.—(*q*) 1 ♀ and 1 juv. from Tulbagh Road Station (*W. F. Purcell*); fourth caudal segment $1\frac{1}{2}$ times as long as wide; large, length of ♀ 44 mm.

Worcester Div.—(*r*) 1 ♂, 1 ♀, and 1 juv. from near the village (*R. M. Lightfoot, W. F. Purcell*); pedipalps with black stripes; fourth caudal segment in ♂ twice, in ♀ $1\frac{2}{3}$ times as long as wide; large, length of ♂ 41 mm.

(*s*) 1 ♂, 4 ♀ and several juv. from Rabiesberg near Nuy River Station (*W. F. Purcell*); pedipalps with infuscate marks; fourth caudal segment $1\frac{3}{4}$ times as long as wide in ♀.

(*t*) 1 juv. from Touws River Station (*W. F. Purcell*); pedipalps with very distinct black stripes.

Uroplectes alstoni, n. sp.

♂ ♀. *Colour* pale ochraceous; the legs paler yellow, with the upper and lower edges blackened; the 3 groups of eyes black; the cephalothorax along the anterior and lateral margins, the abdominal tergites on the keels, coarser granules and lateral margins, and the tail on the keels, finely blackened; the fifth caudal segment with its surfaces infuscated in the anterior $\frac{2}{3}$ only; pedipalps and chelicerae not infuscated.

Cephalothorax thickly granular, the posterior pair of crests distinct in the ♂, the superciliary ridges of the tubercle smooth above in the ♀ but granular throughout in the ♂.

Tergites and *sternites* as in *carinatus*, the last sternite smooth laterally.

Tail slenderer than in *carinatus*, the fourth segment in the ♂ $2\frac{1}{3}$, in the ♀ $1\frac{6}{7}$–$1\frac{7}{8}$ times as long as wide; all the crests denticulate, the terminal tooth of the superior crests in segments 1–3 and of the upper lateral crests in segments 1–2 enlarged, slender and spiniform

in the ♂, stouter and conical in the ♀; the middle lateral crest as in *carinatus*, occupying in segment 3 about $\frac{2}{3}$–$\frac{3}{4}$ of the length of the segment, almost absent in segment 4. Segments 1–4 minutely granular above and on the sides but almost smooth below in the ♂, mostly smooth in the ♀; segment 5 with the upper surface smooth along the middle but weakly granular towards the sides in the ♂, quite smooth in the ♀; the sides of this segment finely and thickly granular in the ♂, more sparsely granular in the ♀; under surface of segment 5 with distinct median and accessory crests and a number of scattered fine and coarse granules. Vesicle weakly granular below.

Pedipalps.—Femur finely granular above. Tibia finely granular above in ♂, smooth in ♀, the anterior edge of upper surface sharply marked and granular. Hand in ♂ considerably, in ♀ slightly wider than tibia, the length of the tibia in ♂ $2\frac{1}{8}$, in ♀ $2\frac{1}{3}$ times the width of the hand; movable finger distinctly lobed at base in ♂.

Legs finely granular externally on the femora and, in the ♂, on the tibiæ also.

Pectines with 25–26 teeth in ♂ and 21–22 in ♀; the basal tooth in the ♀ resembling the rest.

Measurements.—Total length ♂ 35, ♀ 43; length of cephalothorax ♂ 3·3, ♀ 3·8, of tail ♂ 22, ♀ 23; length and width of first caudal segment ♂ 2·8, 2, ♀ 2·8, 2·4, of second ♂ 3·1, 1·8, ♀ 3·2, 2·2, of third ♂ 3·3, 1·7, ♀ 3·4, 2·2, of fourth ♂ 4, 1·7, ♀ 4·1, 2·2, of fifth ♂ 4·4, 1·7, ♀ 4·7, 2·2, of sixth ♂ 3·6, 1·5, ♀ 4·5, 2; length of tibia of pedipalp ♂ 3·6, ♀ 4·1, of hand-back ♂ 2·6, ♀ 2·4, of movable finger ♂ 3·4, ♀ 4·6; width of tibia ♂ 1·3, ♀ 1·6, of hand ♂ 1·7, ♀ 1·8.

Localities.—(*a*) 1 ♂ (type, reg. no. 477) and 1 ♀ from Touws River Station, Worcester Div. (*W. F. Purcell*). A 5-striped young individual, evidently belonging to *U. carinatus*, was found along with these specimens (see under (*t*) p. 180).

(*b*) 1 ♂ from Matjesfontein, Worcester Div. (*W. F. Purcell*); resembling the types, except that the fourth caudal segment below and the fifth segment above and below are much more thickly granular, and the enlarged terminal teeth of the superior crests of the anterior segments are stout and conical; posterior crests on the cephalothorax not distinct; number of pectinal teeth 24; pedipalps somewhat infuscated in places.

(*c*) 1 ♂ and 1 ♀ collected in Barkly Div., Cape Colony, along the west side of the Harts River between this river and the Kaap Plateau by Mr. Garwood Alston, in whose honour the species has

been named. With more black; tergites with broader median and marginal stripes and with a lateral infuscate mark on each side in addition; cephalothorax with black marks also along the median line; hands with infuscate stripes; chelicerae slightly blackened; fifth caudal segment more extensively blackened than in types. Cephalothorax in both sexes with the pair of posterior keels blackened and as strong as or even stronger than the lateral keels on sixth tergite; the crests on the eye-tubercle smooth in the middle above. Cauda very slightly slenderer, the fourth segment in ♂ $2\frac{1}{3}$ times, in ♀ twice as long as wide; the granulation in ♂ as in the ♂ from Matjesfontein, in ♀ the sides of the tail and the under surface of fourth segment also granular; the spiniform terminal teeth of superior crests in ♂ long and slender. Tibia of pedipalps smooth above, its length in the ♂ about $1\frac{1}{4}$ times, in the ♀ twice the width of the hand. Pectines with 22–23 teeth, the basal tooth in the ♀ widened and slightly elongated, falciform. Total length ♂ 40, ♀ 53; length and width of fourth caudal segment ♂ 4·3, 1·8, ♀ 5·3, 2·6, of tibia of pedipalp ♂ 3·8, 1·3, ♀ 4·8, 1·8; width of hand ♂ 1·7, ♀ 2·4.

(*d*) 3 ♀ from Namies, Great Bushmanland, Kenhart Div. (*Max Schlechter*), apparently belonging here; slightly less blackened than in the types from Touws River, except on the hands, which have infuscate stripes and reticulation; the fourth caudal segment about twice as long as wide; the middle lateral crest in segments 2–3 only slightly abbreviated anteriorly, distinctly developed in segment 4 throughout the greater part of its length; segments 1–4 almost smooth below and on the sides or segment 4 granular; tibia of pedipalps sometimes granular above, its length about $2\frac{1}{2}$–$2\frac{3}{5}$ times the width of hand; hand finely granular in front, slightly wider than the tibia; pectines with 23–27 teeth, the basal tooth $1\frac{1}{4}$–$1\frac{3}{4}$ times as wide as, and generally a little shorter than, the adjacent teeth. Length of largest specimen 44; length and width of fourth caudal segment 4·7, 2·3, of tibia of pedipalp 4·7, 1·6; width of hand 1·7.

Uroplectes karrooicus, n. sp.

♂ ♀. *Colour* pale yellow or pale ochre-yellow; cephalothorax blackened along anterior margin, on eye-tubercle and on some of the coarser granules; tergites blackened on the keels and on the lateral margins, and often with an infuscate mark on each side; tail with the crests finely blackened, the fifth segment infuscated to near hind margin; legs blackened along upper and lower edges;

chelicerae finely reticulated with black; pedipalps only very slightly infuscated, the hands not distinctly striped with black.

Cephalothorax finely granular, with few coarse granules and without distinct crests; ocular tubercle smooth in ♀ but granular before and behind in the ♂.

Tergites and *sternites* as in *carinatus*.

Tail rather long and slender, especially in the ♂; the fourth segment in the ♂ $2\frac{2}{3}$ times, in the ♀ very slightly more than twice as long as wide; crests as in *carinatus*, the anterior infero-median ones denticulate to nearly smooth in the ♂, mostly smooth in the ♀; the enlarged terminal teeth of superior crests conical; the middle lateral crest developed in the posterior $\frac{1}{3}$–$\frac{2}{3}$ in segment 3, absent in segment 4; intercarinal spaces in segments 1–4 mostly smooth, or the sides sparsely granular; segment 5 smooth above in ♀, thickly granular in ♂; the sides and under surface of segment 5 rather thickly granular, the under surface with coarse granules which form accessory crests in the anterior part; vesicle distinctly granular below.

Pedipalps slender. Tibia finely granular above in ♂, almost smooth in ♀, the anterior edge of upper surface sharply marked and granular; length of tibia in ♂ $2\frac{4}{5}$, in ♀ 3–$3\frac{1}{5}$ times the width of the hand. Hand slender, minutely granular anteriorly in the ♂, nearly smooth in the ♀; its width slightly exceeding that of tibia in ♂ and slightly less than this width in ♀; the movable finger in ♂ long, twice as long as hand-back, the lobe at base very weak.

Legs granular exteriorly.

Pectines with 23–25 teeth, the basal tooth in the ♀ either normal or slightly wider and longer than the rest, falciform.

Measurements of largest ♂ and ♀.—Total length ♂ 40, ♀ 42; length of cephalothorax ♂ 3·8, ♀ 3·8, of tail ♂ 26, ♀ 23; length and width of first caudal segment ♂ 3·2, 2·1, ♀ 2·8, 2·3, of second ♂ 3·8, 1·8, ♀ 3·2, 2·1, of third ♂ 4·2, 1·8, ♀ 3·4, 2, of fourth ♂ 4·8, 1·8, ♀ 4·1, 2, of fifth ♂ 5·2, 1·8, ♀ 4·6, 2, of sixth ♂ 4, 1·6, ♀ 4·1, 1·7, of tibia of pedipalps ♂ 4·2, 1·4, ♀ 4·3, 1·5; width of hand ♂ 1·5, ♀ 1·4; length of hand-back ♂ 2·4, ♀ 2·2; of movable finger ♂ 4·6, ♀ 5.

Localities in Cape Colony.—(*a*) 2 ad. ♂ (types, reg. no. 475), 3 ad. ♀ and a number of juv. from round the village of Beaufort West (*W. F. Purcell*). I also collected two ♂ of *U. carinatus* in the same locality, but these were easily distinguishable by their colour (see under (*a*), p. 178).

(*b*) 1 ad. ♂ and 1 ♀ from Laingsburg, Prince Albert Div. (*W. F.*

Purcell); colour and structure as in the types, except that the fifth caudal segment is smooth above in the ♂ ; length of fourth segment in ♂ nearly $2\frac{3}{4}$, in ♀ $2\frac{1}{5}$ times as long as wide. Length ♂ 38, ♀ 38·5; length and width of fourth caudal segment ♂ 4·8, 1·7, ♀ 4·4, 2.

(*c*) Three young specimens from round the village of Prince Albert (*W. F. Purcell*). I also found several specimens of *U. carinatus* inhabiting the same locality (see under (*c*), p. 178).

There is very little difference between the females of *alstoni* and *karrooicus*, although the males are easily separable.

Uroplectes schlechteri, n. sp.

♀. *Colour* pale yellow, the abdomen sometimes olivaceo-ochraceous; the three groups of eyes black; the anterior, lateral and often also the posterior margins of the cephalothorax and of most of the tergites very finely blackened, but the tergal keels of first 6 segments not blackened; the inferior keels of posterior caudal segments and the anterior $\frac{2}{3}$ of fifth segment infuscated; the legs blackened along lower edges; cheliceræ with fine infuscate reticulation.

Cephalothorax finely granular, the posterior pair of crests distinct or indistinct, the eye-tubercle smooth.

Tergites and *sternites* as in *carinatus*.

Tail long, the fourth segment $2\frac{1}{2}$ times as long as wide; the crests in segments 1–4 for the most part feebly denticulate, the infero-medial, and for the most part also the infero-lateral keels smooth in segment 1; middle lateral crest strongly abbreviated in segments 2–3, being present only in the posterior $\frac{1}{2}$ or $\frac{1}{3}$ in segment 2 and in the posterior $\frac{1}{4}$ or $\frac{1}{5}$ in segment 3, wholly absent in segment 4; upper surface of tail somewhat granular in anterior, smooth in posterior segments; the intercarinal surfaces on the sides and below almost entirely smooth in segments 1–4, except between the superior and upper lateral crests in segment 1; segment 5 almost smooth, or with a few weak granules on the sides, the under surface with the usual 3 finely denticulate keels, the surfaces between these keels with an irregular series of coarser remote granules along the middle on each side; vesicle weakly and sparsely granular below.

Legs sparsely granular or nearly smooth externally.

Pedipalps.—Femur mooth above. Tibia smooth above, its upper surface with the anterior border sharply marked and granular, its length $2\frac{2}{3}$–3 times the width of the hand. Hand slightly exceeding or almost equalling tibia in width.

Pectines with 23–24 teeth, the basal tooth broad but very short, triangular.

Measurements of type.—Total length 46; length of cephalothorax 4·6, of tail 27·5; length and width of first caudal segment 3·4, 2·5, of second 4, 2·1, of third, 4·4, 2·1, of fourth 5, 2, of fifth 5·3, 2, of sixth 4·5, 2, of tibia of pedipalp 4·8, 1·7; width of hand 1·8; length of hand-back 2·7, of movable finger 5·2.

Localities in Cape Colony.—(*a*) Type: 1 ♀ (reg. no. 2,976) from Naroep, Great Bushmanland, Namaqualand Div. (*Max Schlechter*). *U. carinatus* also occurs near this place (see under (*e*), p. 178).

(*b*) 1 ♀ from Namies, Gt. Bushmanland, Kenhart Div. (*Max Schlechter*). Another species, which I believe to be identical with *U. alstoni*, n. sp., occurs in this locality also (see under (*d*), p. 182).

(*c*) 1 ♀ from Nous, Gt. Bushmanland, in the northern part of Kenhart Div. (*Max Schlechter*).

Uroplectes triangulifer (Thor.).

1877. *Tityus t.*, Thorell, Atti Soc. ital., *v.* 19, p. 123, ♂ ♀.

1890. *Uroplectes t.*, Pocock, P.Z.S., 1890, pl. 13, figs. 5–5*b*.

1896. *U. t.*, Pocock, Ann. Mag. N.H. (6), *v.* 17, p. 384; also, 1898, *ibid.* (7), *v.* 1, p. 310 (locality).

1899. *U. t.*, Kraepelin, Das Tierr., Scorp. & Pedip., p. 59.

1900. *U. t.*, Penther, Ann. Naturh. Hofm. Wien, *v.* 15, p. 157 (locality).

*Localities.**—

a. *U. triangulifer* (*typicus*). Tergites of abdomen fuscous, black or greenish-black, with three rather wide, longitudinal, yellow stripes (a median and two marginal) and a large > -shaped yellow mark on each side of the median stripe; cephalothorax with much yellow; caudal segments with infuscate stripes below and generally also on the sides, the fifth segment generally more or less infuscate; the femora of legs, when partially infuscated, with the infuscate marks present in the distal part of the outer surface at least. (Pedipalps with the tibia, except at base, and the hands, except on the fingers, more or less infuscate or black, the hands provided with stripes and reticulation.) The specimens in the collection with this typical colouration fall into two groups:—

* *U. triangulifer* has been recorded by Pocock from Pretoria and Pietersburg (Transvaal), Basutoland, and Port Elizabeth, and by Penther from the Albany Div. (C. Col.).

A. *With the basal pectinal tooth not enlarged in the* ♀, *the fourth caudal segment in the* ♂ *not more than* $2\frac{1}{4}$ *times as long as wide.*

(*a*) Kroonstad. 2 ♂ and 2 ♀ (*W. Watermeyer*): Sides of the fifth caudal segment in ♀ coarsely granular in lower but very weakly granular in upper part, the superior margins smooth or almost so, except on the short anterior crest; the sides in the ♂ much pitted and with only a few very weak granules or nearly smooth; upper surface of femur of pedipalp also infuscate; cephalothorax with the prevailing colour black, but with numerous yellow markings. Length of largest ♂ and ♀ 51, 47; length and width of fourth caudal segment in ♂ 6·2, 2·8, in ♀ 4·7, 3. In Thorell's types, which agree very closely with these specimens, the superior margins of the fourth caudal segment were also smooth, and the basal pectinal tooth of ♀ is not mentioned as being enlarged; the type-specimens measured ♂ 47, ♀ 42, length and width of fourth caudal segment in ♂ 5·5, 2·5, in ♀ 4·5, 3.

(*b*) Kimberley. 2 ♀ (*G. A. Quenet*): Tail resembling that of the specimens from Kroonstad, but the sides of the fifth segment almost smooth, with some granulation in the lower part, while the body and limbs are much less infuscate. Length 47, length and width of fourth caudal segment 5·1, 3·2.

(*c*) Brakkloof, near Grahamstown. 2 ♂, 5 ♀, and a number of juv. (collected by Mrs. G. White and presented by Dr. Schönland, of the Albany Museum): Sides of the fifth caudal segment as well as the upper margins densely and coarsely granular throughout in the ♀; the sides of this segment in the ♂ more sparsely granular and the superior edges almost smooth, except anteriorly. Prevailing colour of cephalothorax yellow, the principal infuscate mark being a large **V** enclosing the yellow interocular area. Length of largest ♂ and ♀ 50, 43, length and width of fourth caudal segment in ♂ 5·8, 2·6, in ♀ 4·5, 2·9.

(*d*) Grahamstown, Albany Div. 2 ♂ and 1 juv. (*Rev. J. A. O'Neil*): Resembling the specimens from Brakkloof, but the superior margin of 5th caudal segment sparsely granular in ♂ and the cephalothorax more black than yellow, on the interocular area only the anterior part being yellow. Length of largest ♂ 48, length and width of fourth caudal segment 5·6, 2·6.

(*e*) Port Elizabeth. 2 ♀ (*J. L. Drège*): Colour of cephalothorax and granulation of tail as in the specimens from Brakkloof. Length 43, length and width of fourth caudal segment 4·1, 2·8.

(*f*) Dunbrody, on the Sundays River, Uitenhage Div. 1 ♂, 2 ♀, and several juv. (*Rev. J. A. O'Neil*): Colour of cephalothorax and

granulation of tail as in the examples from Brakkloof. Length of ♂ and ♀ 42·5, 45, length and width of fourth caudal segment in ♂ 5·2, 2·4, in ♀ 4·5, 2·7.

(*g*) Kingwilliamstown. 1 ♀ (*F. A. Pym*): Colour of cephalothorax and granulation of tail as in the examples from Brakkloof.

B. *With the basal pectinal tooth enlarged in the* ♀, *the tail relatively slightly longer and narrower in the* ♀ *and especially in the* ♂, *the fourth segment as much as* $2\frac{1}{2}$ *times as long as wide in the larger males.*

(*h*) Johannesburg. A large number of ♂, ♀, and juv. (*J. P. Cregoe, H. A. Fry*): With the tibia of pedipalp (except at base) and the hands strongly infuscated, but the femur yellow; the cephalothorax with much black, the interocular area almost quite black with only a small, anterior, median, yellow spot. Granulation of tail as in the examples from Blakkloof, etc., the superior margins of fourth caudal segment in ♂ nearly smooth, except anteriorly, or sparsely granular. Length of a large ♂ and ♀ 52, $45\frac{1}{2}$, length and width of fourth caudal segment in ♂ 6·1, 2·4, in ♀ 4·7, 2·8. In small males the tail is relatively shorter, as in group A, but these are probably immature specimens, although otherwise resembling the largest ones.

β. U. triangulifer var. *tristis*, Thorell, Atti Soc. ital., *v.* 19, p. 123, 1877. Trunk black or olivaceous-black, without yellow markings or with a yellow stripe along the median line of the tergites only; tail fuscous brown to black, with or without a pair of yellow lines below; pedipalps black or brown, the distal part of the femur and often also the base of tibia and the fingers yellow; the femora of legs black or brown proximally but yellow distally. Eastern part of Transvaal.

(*a*) Barberton. 2 ♂, 4 ♀, and 2 juv. (*J. P. Cregoe*): Black or olivaceous-black, the median yellow line on tergites absent or confined to the posterior half of the segment; cauda with yellow lines below; pedipalps with distal two-thirds of femur, the base of the tibia, and the fingers yellow; femora of legs yellow distally for more than half their length, the tibiæ broadly yellow at both base and apex; fifth caudal segment granular on sides in ♀ but almost smooth (with some weak granulation in lower part) in ♂, the superior crests more or less granular in ♀ but quite smooth, except on the anterior crest, in ♂; basal pectinal tooth more or less enlarged in ♀. Length of largest ♂ and ♀ 41, 41, length and width of fourth caudal segment in ♂ 4·8, 2·3, in ♀ 3·7, 2·4.

(*b*) Lydenburg, Transvaal. 1 ♂ and ♀ (*Dr. J. W. B. Gunning*, of the Pretoria Museum): Yellow median line on tergites broader and continuous throughout whole segment; tail dark brown, the under

side with two yellow stripes anteriorly but fuscous posteriorly; pedipalps dark brown, the femur at apex (and the fingers in ♀) yellow; femora of legs yellow distally for less than half their length, tibiæ dark brown, yellow only quite at the base; the sides and superior margins of fifth caudal segment thickly granular in ♀, more sparsely and finely granular in ♂, the basal pectinal tooth much enlarged in ♀. Length of ♂ and ♀ 47, 47, length and width of fourth caudal segment in ♂ 5·3, 2·6, in ♀ 4·5, 2·9.

Uroplectes lineatus (C. L. Koch).

1845. *Tityus l.*, C. L. Koch, Die Arachn., *v.* 11, p. 7, fig. 854.
1891. *T. l.*, Kraepelin, Jhb. Hamb. wiss. Anstalten, *v.* 8, p. 89.
1896. *Uroplectes l.*, Pocock, Ann. Mag. N.H. (6), *v.* 17, p. 382.
1899. *U. l.*, Kraepelin, Das Tierreich, Scorp. & Pedip., p. 60.
1900. *U. l.*, Penther, Ann. Naturh. Hofm. Wien, *v.* 15, p. 157 (localities).

This very common species occurs only in the southern portion of Cape Colony, where it inhabits an area extending from Cape Town along the south coast eastwards at least as far as Mossel Bay and northwards into the Divs. of Tulbagh and Worcester. Outside this area *lineatus* * is not known to occur, being replaced to the north by *carinatus* and its allies, and to the east by *triangulifer* and *formosus*.

The species is subject, as usual, to a certain amount of local variation, chiefly as regards the proportions of the caudal segments, the size of the enlarged terminal tooth of the superior caudal crests, and the colouration. The boundary between the lateral and inferior surfaces in the fifth caudal segment is generally marked by a more or less distinct edge or by a row of granules, but sometimes it is almost obliterated. The enlarged terminal tooth of the superior crests in segments 2 and 3 in the ♂ is larger than in the ♀, and is rather slender, at least in the apical part, in one or both segments. The tubercle below the aculeus is normally strong and toothlike, laterally compressed and generally more or less pointed, occasionally, however, low and blunt. In young individuals this tubercle is relatively longer and slenderer than in the adult. The basal pectinal tooth is never elongated in the ♂, and in the ♀ it is only moderately enlarged and does not project beyond the apices of the adjacent teeth. The vesicle is yellow, often with several narrow, lightly (rarely darkly) infuscate stripes.

* Penther states that the species occurs at Mossel Bay and at Grahamstown.

The following is a list of the localities from which the Museum has obtained specimens :—

Cape Div. (*a*) Cape Peninsula. *U. lineatus* is very common under stones, etc., on the hills and mountain sides throughout the Peninsula, but on the sandy Flats it is much more rarely met with. It is often found also in gardens, and sometimes even in houses, in Cape Town itself. The abdomen has five longitudinal yellow stripes or rows of yellow marks, viz., one median, one on each lateral margin, and one between these on each side. The three middle yellow stripes are generally divided into an anterior and posterior part by a patch of black in each of the posterior or in all the tergites, or the inner lateral stripes * are represented in the posterior segments by a pair of > < marks. The median keel is also generally infuscated. Cephalothorax strongly blackened, with a number of yellow stripes and marks. Vesicle ochre-yellow, with or without faint infuscate marks. Enlarged terminal tooth of superior caudal crests in segments 2 and 3 in the ♂ conical and very strong at base, slenderer towards the apex, where it is sharply pointed and curved in one or both segments. In the ♀ the terminal tooth is smaller, conical and mostly pointed but generally not curved at the apex. The boundary line between the lateral and inferior surfaces in segment 5 is more or less distinct and marked, at least posteriorly, by a row of granules. The pectinal teeth vary from 17–20 in the ♀ and from 18–21 in the ♂. Large; length of largest ♂ 45, ♀ 45; length and width of fourth caudal segment in ♂ 5, 2·6, in ♀ 4, 2·7. In the largest males this segment is less than twice (generally about $1\frac{9}{10}$) as long as wide, but in smaller (immature?) males it is stouter, often only $1\frac{3}{4}$ times as long as wide.

Paarl Div. (*b*) French Hoek: 4 ♀ and juv. (*W. F. Purcell*), resembling those from the Cape Peninsula.

Stellenbosch Div. (*c*) Jonkershoek: 1 ♂, 3 ♀, and 3 juv. (*W. F. Purcell*), resembling the specimens from the Cape Peninsula.

Tulbagh Div. (*d*) North end of the Roode Zands Mountains: 1 ♀ (*W. F. Purcell*), resembling the specimens from the Cape Peninsula.

Worcester Div. (*e*) Slanghoek: 2 ♂, 19 ♀, and 4 juv. (*R. Francke, W. F. Purcell*), resembling the specimens from the Cape Peninsula, but the fourth caudal segment about $2\frac{1}{10}$ as long as wide in ♂. Length of largest ♂ 38, length and width of fourth caudal segment 4·4, 2·1.

* In specimens from the Cape Town slope of Signal Hill these lateral stripes (but not the median stripe) are frequently continuous throughout the segments, and not at all or scarcely interrupted by black bars.

(*f*) Village of Worcester, at the railway station : 1 ♂, 1 ♀ (*C. L. Leipoldt*), resembling the specimens from the Cape Peninsula.

(*g*) Touws River Station : 1 dried ♀ (*W. F. Purcell*).

Ceres Div. (*h*) Ceres Village : 12 ♀ and several juv. (*R. M. Lightfoot, W. F. Purcell*). In these specimens the three middle yellow stripes on the abdomen are continuous, *i.e.*, not interrupted by transverse bars of black in the middle of each tergite, the median keel also generally not blackened ; otherwise as in the specimens from the Cape Peninsula.

Caledon Div. (*i*) Hottentots Holland Mountains, on the summit near Sir Lowry's Pass : 9 ♂, 7 ♀, 4 juv. (*W. F. Purcell*), closely resembling the specimens from the Cape Peninsula but slightly smaller in size ; length of largest ♂ 37½, length and width of fourth caudal segment 4·1, 2 ; fourth caudal segment in the 6 largest ♂ specimens (32–37½ mm. long) twice, in the 3 smaller (immature ?) ♂ specimens (29½–31¾ mm. long) 1¾–1⅞ times as long as wide.

(*j*) Venster Ravine at the village of Caledon : 5 ♀, 1 juv. (*W. F. Purcell*), resembling the specimens from the Cape Peninsula.

Swellendam Div. (*k*) The Pass at Avontuur near Stormsvlei, on the River Zonder Einde : 1 juv. (*W. F. Purcell*).

(*l*) Swellendam Village : 1 ♀ (*H. A. Fry*) ; the three middle yellow stripes on abdomen continuous ; the vesicle ochre-yellow, with five dark infuscate stripes on the sides and below, darkly infuscate also on the superior lateral margins anteriorly. Closely resembling Koch's figure of *U. striatus* (C. L. Koch) in colouration.

Bredasdorp Div. (*m*) Marcus Bay : 2 ♂ (*H. A. Fry*). The three middle yellow stripes on abdomen broad and continuous, the cephalothorax with much black. The edge between the lateral and inferior surfaces of fifth caudal segment almost obliterated ; the terminal tooth of the superior crests in segments 2–3 strong and sharp but scarcely curved ; the fourth caudal segment 2–2⅑ times as long as wide. Length of largest ♂ 33, length and width of fourth caudal segment 3·8, 1·8 ; length of the other ♂ 32, length and width of fourth segment 3·6, 1·8.

Robertson Div. (*n*) Ashton, on the mountain side at entrance to Kogmans Kloof : 1 ♂, 1 ♀, 1 juv. (*Mrs. W. F. Purcell* and *W. F. Purcell*). The three middle yellow stripes on abdomen broad and continuous, not interrupted by cross bars of black ; the cephalothorax yellow, blackened only along the median line and at the edges ; the terminal tooth of superior caudal crests not much enlarged in segments 2 and 3, small and rather slender in both sexes ; sides of fifth segment distinctly bordered below by a row of granules ; fourth

caudal segment in ♂ about $2\frac{1}{7}$ times as long as wide; length of ♂ 41, length and width of fourth caudal segment in ♂ 4·3, 2.

Mossel Bay Div. (*o*) 2 ♀ from near the town (*W. F. Purcell*). The three middle yellow stripes on abdomen broad and continuous, but the cephalothorax with much black; the superior terminal teeth in segments 2–3 of tail conical, strong; proportions of tail much as in the specimens from the Cape Peninsula; infero-lateral edges of the fourth caudal segment more or less distinct.

Uroplectes insignis Poc.

1890. *U. insignis*, Pocock, P.Z.S., 1890, p. 132, pl. 13, fig. 4, ♀.

1896. *U. lineatus* subsp. *insignis*, Pocock, Ann. Mag. N.H. (6), *v.* 17, p. 382.

1899. *U. lineatus* var. *insignis*, Kraepelin, Das Tierr., Scorp. and Pedip., p. 60.

The Museum possesses 6 ♂, 3 ♀, and 4 juv. from the Cape Peninsula.

U. insignis was originally described by Pocock as a distinct species but was subsequently regarded by him as a melanistic subspecies of *lineatus*. *U. insignis* is not, however, more blackened than the darkest specimens of *lineatus* from the Cape Peninsula, except on the vesicle and inferior surface of the cauda, and it differs in colour from such specimens principally in the following points: (1) The yellow >< -shaped marks are as distinct on the anterior as on the posterior abdominal tergites, whereas in *lineatus* these marks are always more or less resolved into a pair of irregular yellow blotches in the anteriormost tergites at least; (2) the anterior caudal segments are provided with a pair of longitudinal black stripes below divided by a fine median yellow line (in *lineatus* the under side of the anterior segments is yellow with a fine median black line, which generally extends over the last abdominal sternite as well); (3) the vesicle is deeply blackened on the sides and below, and provided below with two narrow, and on each side with a broader, lateral, yellow, longitudinal stripe, the upper surface more lightly infuscate in the middle part (in *lineatus* the vesicle is always ochraceous, with a narrow inferior median line and the anterior lateral angles darker or lightly infuscate, the sides also often with faintly infuscate stripes, two such stripes when distinctly marked corresponding on each side to the single broad infero-lateral black area of *insignis*).

In *insignis* the tubercle below the aculeus, although always distinct, is, as already noticed by Pocock, smaller and weaker than in

lineatus, being merely conical and blunted in the adult and not sharply toothlike or distinctly laterally compressed, as is the case with *lineatus* from the Cape Peninsula. In young individuals, however, the tubercle is relatively longer and slenderer than in the adult. The enlarged terminal superior tooth in second and third caudal segments is thick and blunt at the apex in the ♂, and not slender and curved at the apex as in the ♂ of *lineatus*. In the ♀ of *insignis* this tooth is also thick and very blunt at the apex, although slightly smaller than in the ♂, whereas in the ♀ of *lineatus* from the Cape Peninsula it is slenderer apically than in *insignis* and much more pointed in at least one of the segments.

The basal tooth of the pectines in the ♀ is much more enlarged than in *lineatus* and, moreover, projects slightly but distinctly beyond the line of the rest. In the ♂ the pectinal teeth are broader, and with the exception of the basal one, more imbricating than in *lineatus*, so that the basal tooth when viewed from below appears distinctly broader than the exposed part of the adjacent teeth. This is not the case in *lineatus*. In the ♂ of *insignis* this basal tooth is further actually enlarged and distinctly exceeds the adjacent tooth in width and length. The number of the teeth varies in the ♀ from 16–18 (15–17 in Pocock's specimens) and in the ♂ from 17–20.

U. insignis is much rarer than *lineatus*, and has hitherto been found only at certain places in the Cape Peninsula. Most of our specimens were obtained on the Newlands and Constantia slopes of Table Mountain by Mr. W. L. Sclater, while a single example was found by Mr. R. M. Lightfoot on the Kalk Bay Mountain. According to Pocock Dr. H. A. Spencer obtained *insignis* only on Table Mountain and *lineatus* only on the lower ground. As a matter of fact, however, *lineatus* is common on the mountain sides as well, and I have myself found both forms living side by side at the foot of the mountain at Newlands. I think, therefore, that *insignis* is something more than merely a melanistic mountain form of *lineatus*, and prefer to regard it as a distinct species for the present at any rate, although the structural differences between the two forms cannot be regarded as of any considerable specific importance.

The boundary between the lateral and inferior surfaces of the fifth caudal segment is generally just distinguishable as a weak edge with or without a row of granules.

Uroplectes marlothi, n. sp.

♀. *Colour.*—Trunk olive-greenish to brownish black, the abdomen with a broad, continuous and very conspicuous pale yellow

median band above; tergites 1–6 also, as in *insignis*, with the usual >< mark and with a narrow longitudinal stripe on each side near the lateral border inconspicuously yellow; cephalothorax much paler and more yellowish anteriorly, with a large posterior median mark, an oblique mark on each side of the median tubercle and various other marks inconspicuously yellow. Tail olive-greenish black on the sides and below, with some obscure brownish or yellowish markings, the upper surface obscurely brownish or brownish yellow, infuscate along the middle; vesicle as in *insignis*. Under side of trunk pale yellowish, but the last abdominal sternite black. Legs pale yellow, with a few infuscate markings. Pedipalps pale yellow, with large infuscate patches, the hands striped and reticulated.

Cephalothorax rather sparsely and finely granular, almost smooth on the interocular area and around the median tubercle.

Tergites almost entirely smooth, or sparsely granular laterally in the posterior part of the segments; median keel smooth.

Sternites smooth, without trace of keels.

Cauda relatively longer than in *insignis* and *lineatus*, the fourth segment $1\frac{2}{3}$ times as long as wide; second, third, and fourth segments when seen from above almost parallel-sided, scarcely at all bulging convexly from before to behind; no well-developed granular crests; the superior edges weakly subcrenular, terminating behind in segments 2–3 in a low stout blunt tubercle; the two upper lateral keels also indicated in segment 1 and smooth or subcrenular; all other keels absent; sides and under surface of segments 1–3 smooth or nearly so, or the sides with a few granules; segment 4 rather weakly but thickly granular; segment 5 more coarsely and thickly granular, especially below, without trace of an edge or keel between the lateral and inferior surfaces; upper caudal surface granular mesially in segment 1, smooth in the other segments; vesicle thickly granular, the tubercle below the aculeus very low, convex or almost quite obsolete, never pointed or toothlike.

Pedipalps.—Femur finely granular above; upper surface of tibia smooth, with a strip of granules along its anterior edge; hand smooth, stouter than the tibia, the dentition much as in *lineatus*.

Legs.—Femora and generally also the posterior tibiæ granular externally.

Pectines with 18–22 teeth, the basal one enlarged.

Locality.—6 ad. ♀ collected on the summit of the Great Winterhoek (altitude above 6,800 feet), Tulbagh Div., by Dr. R. Marloth, Messrs. Gother Mann and Bolus.

Measurements.—Total length 43 ; length of cephalothorax 4·7, of tail 24·5 ; length and width of first caudal segment 2·8, 2·9, of second segment 3·4, 2.7, of third segment 3·5, 2·6, of fourth segment 4·4, 2·6, of fifth segment 4·8, 2·6, of sixth segment 4·9, 2·3 ; length of tibia of pedipalp 4.5, 1.9 ; width of hand 2·2 ; length of hand-back 3·3, of movable finger 4·6.

Besides being relatively shorter, the second, third, and fourth caudal segments in the ♀ of *lineatus* and *insignis* appear more convex at the sides from before to behind when seen from above ; in *marlothi* these sides are almost parallel. The granulation on the under surface of the fifth caudal segment in *marlothi* is about as coarse as, although much denser than, that in a ♀ *lineatus* from the Cape Peninsula.

U. marlothi is closely related to *U. insignis*, from which it may be distinguished by the total absence of the infero-lateral crest or edge in the fifth caudal segment.

Gen. OPISTHOPHTHALMUS C. L. Koch.

Opisthophthalmus wahlbergi (Thor.)

Three local races of this species, differing in the colouration of the tail, may be distinguished :—

α. O. wahlbergi (*typicus*) with at most the fifth caudal segment blackened towards the apex, the rest of the tail being yellow.

This agrees with the description Thorell gives of his spirit specimen from the Stockholm Museum, which is said to have been found by Wahlberg in " Caffraria " and may be taken as the type. The South African Museum possesses three specimens from German South-West Africa (*Dr. R. Marloth*), in one of which (a young ♀) the fifth caudal segment is lightly infuscated on the sides and below in the posterior half, while in the other two specimens (described in Ann. S. A. Mus., *v.* 1, p. 140) none of the caudal segments are blackened. This form is not known to occur south of the Orange River, and Wahlberg's specimen doubtless also came from German South-West Africa, probably from Damaraland, whence the species has been recorded by Kraepelin and Pocock.*

β. O. wahlbergi var. *gariepensis*, n., with the fourth caudal segment more or less blackened on the sides and below, the fifth

* *O. wahlbergi* has also been recorded from British Bechuanaland by Penther (Ann. Naturh. Hofm. Wien, *v.* 15, p. 158, 1900), but no mention is made of the colouration.

segment being blackened all round except at the posterior end, which is pale yellow like the vesicle; chelicerae and fingers of pedipalps not darkened.

This form was discovered by Mr. M. Schlechter and described by me as the "Yellow-stinged race" of *wahlbergi* in Ann. S. A. Mus., *v.* 1, p. 139. It is only known from the narrow strip of country lying between Vuurdood and Naroep * in the north of Little Bushmanland, Namaq. Div., immediately south of the Orange (Gariep) River. The Museum has many specimens from Naroep (which may be taken as the types of the variety) and a few from Vuurdood and Hunitsamas, both near Ramonds Drift, and from Zandhoogte between Hunitsamas and Naroep, all of which have been already mentioned in my previous paper.

γ. *O. wahlbergi* var. *nigrovesicalis*, n., with the vesicle, the whole of the fifth caudal segment, a great part of the fourth and often a few patches at the end of the third, blackened or dark olive-green, as are also the fingers of the chelicerae.

This form is identical in colouration with the dried specimen from the Gothenburg Museum mentioned by Thorell, and a very large number of specimens (over 650) has recently been collected by Mr. M. Schlechter and described by me as the "Black-stinged race" of *wahlbergi* in Ann. S. A. Mus., *v.* 1, p. 139. It appears to occur, generally in abundance, throughout Little and Great Bushmanland (in the N.E. part of Namaq. Div. and the N. part of Kenhart Div. in Cape Colony),† and throughout the whole of this area the same type of colouration is preserved.

To the numerous localities given in my former paper (p. 140) may be added (*a*) Beeststert (near Coboop at the Orange River), and (*b*) Zwartmodder, both in Kenhart Div. (*M. Schlechter*).

The specimens from Naroep may be regarded as the types of this variety, and it is noticeable that at this locality both the varieties occur side by side without showing any transitional forms of colouration. It is evident that they do not interbreed.

Opisthophthalmus longicauda Purc.

This species appears to be common in the north of Kenhart Div. in Great Bushmanland, where Mr. M. Schlechter collected the following specimens :—

* *I.e.*, between long. 18° 15′ and 18° 40′ E. of Greenwich.

† This area of distribution extends from about long. 18° (Jackalswater) to about long. 19½° (Zwartmodder), a distance of over 100 miles.

(*a*) 28 ♀ (15 ad.) and 19 ♂ (2 ad.) from Zwartmodder: Number of pectinal teeth in ♀ 15–18, in ♂ 19–23; length of cephalothorax in ♀ 16¼–19 mm., in ♂ 16¼–17½ mm. These specimens are of a much larger size than the types from Naroep, as they measure up to 135 mm. (♀) and 130 mm. (♂) in length. In the ad. ♂ the tail is 4⅖ times as long as the cephalothorax, which is equal to, or slightly less than the femur of the pedipalp in length; moreover, the upper surface of the hand is less smooth than in the types, being more or less granular near the denticulate inner margin. In the ad. ♀ the tail is more than 3¾ and often nearly four times as long as the cephalothorax.

(*b*) 2 ad. ♀, 3 ad. ♂ and a number of juv. from Beeststert near Coboop in the north-west corner of Kenhart Div: Large specimens, nearly equalling *gigas* in size and measuring up to 147 mm. (♀) and 132 mm. (♂) in length.

(*c*) 2 juv. from Beenbreek on the Orange River.

Opisthophthalmus karrooensis Purc.

*Additional localities.**—(*a*) 1 ad. ♂ and several juv. from Kogmans Kloof near Ashton and (*b*) 1 ad. ♀ and several juv. from Hot Baths near Montagu, Robertson Div. (*W. F. Purcell* and *Mrs. W. F. Purcell*): Resembling those from Ashton, but larger; length of cephalothorax in ad. ♀ 17 mm.

(*c*) 9 ♀ (5 ad.) and a number of ♂ (5 ad.) from Jansenville (in the collection of the Albany Museum, and kindly lent by Dr. Schönland): Number of pectinal teeth in ♀ 16–20, in ♂ 21–29; length of cephalothorax in ad. ♀ 11¼–13 mm., in ad. ♂ 11–12½ mm. In the ad. ♀ the fifth abdominal sternite is very weakly granular posteriorly or almost entirely smooth, the length of the hand-back generally very distinctly exceeds the width of the hand, and the first caudal segment is generally almost smooth below in the anterior part and sometimes only very weakly granular in the middle posteriorly. In the ad. ♂ the first abdominal sternite and often also the second (except laterally) are frequently smooth.

Opisthophthalmus austerus Karsch.

Additional localities.—(*a*) 1 ad. ♀ from Middelburg, Cape Colony (*Dr. C. S. Piers*).

* Penther (Ann. Naturh. Hofm. Wien, *v.* 15, p. 159, 1900) has recently recorded this species from the Outeniqua Mountains (George and Knysna Divs.).

(*b*) 1 ad. ♂, 2 ad. ♀ and a number of juv. from Colesberg (*C. L. Leipoldt*). There can no longer be any doubt that *O. colesbergensis* Simon (Soc. ent. Fr. ser., 5, *v.* 10, p. 388, 1880) from the same locality is identical with *austerus* Karsch, as suggested by Kraepelin. The species is evidently nearly related to *karrooensis* Purc.

Opisthophthalmus carinatus (Pet.).

*Additional localities.**—(*a*) 1 juv. ♂ from Beenbreek on the Orange River in north-west of Kenhart Div., Great Bushmanland (*M. Schlechter*): Number of pectinal teeth 32.

(*b*) 1 juv. ♀ from Kakamas on the Orange River in north of Kenhart Div. (*M. Schlechter*): Number of pectinal teeth 16–17.

(*c*) 1 ad. ♂ from the neighbourhood of Upington on the Orange River in south of Gordonia, Bechuanaland: Number of pectinal teeth 30; length of cephalothorax 16½ mm.; colour as in the ♀ from Great Bushmanland previously described; under surface of abdominal and anterior caudal segments almost smooth, only faintly transversely striated in places; length of hand-back exceeding width of hand.

(*d*) 9 ♀ (3 ad.) and 7 ♂ (2 ad.) collected along the western side of the Harts River (between that river and the Kaap Plateau) in the Barkly Div., Cape Colony (*Garwood Alston*): Number of pectinal teeth in ♀ 16–20, in ♂ 24–28; length of cephalothorax in ad. ♀ 13–14·3 mm., in ad. ♂ 13·3 mm.; hind margin of abdominal tergites generally broadly ochraceous; anterior surface of tibiæ and of distal part of femora of legs generally more or less strongly infuscated; under surface of abdominal and of anterior caudal segments as in the ♂ from Upington (see *c* above); length of hand-back in ad. ♂ equal to the width of hand; width of hand in largest ♀ 10·8, in ♂ 9·2, length of hand-back in ♀ 9·6, in ♂ 9·2, length of movable finger in ♀ 14·5, in ♂ 14·7. These specimens are smaller in size, lighter in colour, and have much narrower hands than the specimens from Bushmanland and Upington.

Opisthophthalmus ater Purc.

A ♀ of this very rare scorpion was recently found by Dr. R. H. Howard on a hillock about nine miles from Port Nolloth, Namaq. Div. It differs from the ♂ in the following points:—

* Penther (Ann. Naturh. Hofm. Wien, *v.* 15, p. 158) has recently recorded the species from the Cango Valley near Oudtshoorn. This locality is very far south of any place from which we have specimens.

♀. *Colour* of the whole animal very dark blackish-brown, the pectines pale yellowish.

Cephalothorax as long as the first and second caudal segments and $\frac{2}{3}$ of the third, its anterior edge emarginate in the middle.

Tergites 2–6 smooth in the middle, but finely granular towards the sides, the median keel smooth in all the segments.

Sternites all smooth; the spiracles narrow, with parallel edges.

Tail.—Upper surface finely and sparsely granular in the anterior, but smooth in the posterior segments, the terminal tooth of the superior crests enlarged in segments 1–4; sides of the tail smooth or with a few fine granules between the keels; ventral surface of segments 1–2 smooth, polished and minutely punctate, that of segment 3 more uneven, especially laterally, but not granular, that of segment 4 weakly and thickly granular; the infero-lateral keels smooth and almost obsolete in segment 1, smooth and very weak in segment 2, weak but granular posteriorly in segment 3, quite distinct and weakly granular in segment 4; vesicle smooth on the basal half below.

Pedipalps.—Upper crest of tibia coarsely granular, the posterior surface less granular than in ♂; hands less hairy, broad, moderately convex, and thickly covered above with low tubercles, which are more isolated but anastomose somewhat near the inner basal angle; inner edge of hand with blunt granules; width of hand considerably exceeding length of hand-back; the granules of the finger-keel partially fused in the distal part to a short smooth keel, which does not exceed, however, $\frac{1}{4}$ or $\frac{1}{5}$ of the whole length.

Legs.—Terminal tarsal segment of third leg with one, of fourth leg with no external spines below, the outer terminal lobe with four spines in both pairs of legs; the penultimate tarsal segment of third and fourth legs with an external spine below, proximal to the large intersegmental spur (this being also the case in the ♂).

Pectines with 11 teeth, the scape free of teeth at the base for $\frac{2}{5}$ of its length.

Measurements.—Total length 80; greatest length of cephalothorax $11\frac{1}{2}$; width $10\frac{1}{4}$; distance of eyes from anterior median edge $7\frac{3}{4}$; width of hand $8\frac{3}{4}$; length of hand-back $6\frac{1}{2}$, of movable finger $9\frac{1}{2}$, of tail 37.

Opisthophthalmus granicauda Purc.

Additional locality.—1 ad. ♂ from Klipfontein (near Steinkopf), Namaq. Div., Cape Colony (*Dr. R. H. Howard*): Interocular area of

cephalothorax densely and coarsely granular almost throughout, smooth only on a small area at the summit of each lateral convexity.

Opisthophthalmus granifrons Poc.

Additional specimens of the principal form.—1 ad. ♀ and 4 ad. ♂ from Concordia (*J. H. C. Krapohl*): Number of pectinal teeth in ♀ 12, in ♂ 15–16 (rarely 17); length of cephalothorax in ♀ 14 mm., in ♂ $11\frac{1}{4}$–$15\frac{1}{2}$ mm.; tarsus of third leg always with an external inferior spine *; granulation of last abdominal sternite in ♂ as in the specimens from Steinkopf. These specimens agree very closely with those from Steinkopf.

Opisthophthalmus pictus Krpln.

The Museum possesses specimens from the following localities :—

(*a*) 1 ad. ♀ from Port Elizabeth (*J. P. Cregoe*).

(*b*) 9 ad. ♀ from Red House Station (about 9–10 miles from Port Elizabeth), Uitenhage Div. (*J. L. Drège*) : Number of pectinal teeth 11–14; length of cephalothorax 11–$12\frac{1}{2}$ mm.

(*c*) 12 ♀ (9 ad.) and 3 ♂ (2 ad.) from Dunbrody on the Sundays River, Uitenhage Div. (*Rev. J. A. O'Neil*): Number of pectinal teeth in ♀ 10–14, in ♂ 14–16; length of cephalothorax in ad. ♀ $11\frac{3}{4}$–15 mm., in ad. ♂ $12\frac{1}{2}$–$12\frac{3}{4}$ mm.

The colour in all these specimens is much as described by Kraepelin, but the fingers are blackish green and the sides of the cephalothorax are often more or less deeply tinged with olive-greenish. The ♀ has been described in detail by Kraepelin (Jahrb. Hamb. Anst. *v.* 11, p. 102, 1894) but not the ♂, the principal characters of which are the following :—

♂. *Cephalothorax* equalling or very slightly exceeding the first and second caudal segments in length (equalling the first and second and half of the third in the ♀); surface of interocular area smooth or very weakly granular (as is also the case in the ♀).

Tergites 1–6 finely shagreened, the posterior ones more coarsely granular laterally behind (in the ♀ these segments are smooth, or more or less granular laterally).

Sternites of abdomen thickly covered with large coarse tubercles (smooth only along the anterior border of segment 1 and on the lung-books of the anterior segments), which are strongly transverse

* Pocock (Ann. Mag. N.H., ser. 6, *v.* 17, p. 242) records a young specimen from Concordia, in which this spine was absent.

in the mesial portion of the segment in the last 3 or 4 segments, particularly in segment 5, in the mesial part of which are some 10–15 extremely strong ridges. (In the ♀ these tubercles are very weak in the anterior segments and sometimes quite absent in segment 1, while in segment 5 the mesial transverse ridges are lower, although very distinct.)

Tail.—Medial and lateral inferior keels replaced in segment 1 by transverse ridges and rounded tubercles respectively, resembling those of the fifth abdominal sternite in size and appearance; these keels in segments 2–3 distinct, coarsely granular. (In the ♀ segment 1 resembles the fifth abdominal sternite below, while in segments 2 and 3 the inferior keels are weakly or coarsely granular.)

Pectines with the scape somewhat elongated at the base and free of teeth for about a quarter of its length (in the ♀ for about one-third of its length).

Hands lightly convex above, much narrower, the granules on the upper surface smaller, sharper, and more conical and isolated than in the ♀; width of hand exceeding the length of hand-back; the inner edge denticulate; length of hand 19½, width 9, length of hand-back 7⅔, length of movable finger 12½.

In both sexes of this species the finger-keel of the hands is smooth or nearly so for the greater part of its length, or more or less broken up into coarse granules proximally, the granular portion occupying at most half of the whole length. The secondary keels of the hand are denoted principally by 2 black stripes. The superior crest of the tibia of the pedipalp is granular and the posterior surface is provided with the usual series of ridges (sometimes almost obsolete) and generally also with a few coarse granules, at least distally, along the middle. Terminal tarsus of the fourth leg usually with 3 (but often with 4) spines on the outer lobe (4 is the number given by Kraepelin).

Opisthophthalmus crassimanus Purc.

Additional specimens of *variety* β:—

(*a*) 2 ad. ♀ from Bladgrond, Great Bushmanland, Kenhart Div. (*M. Schlechter*).

(*b*) 1 juv. from Beenbreek and (*c*) 1 juv. from Kakamas, both near the Orange River in the north of Kenhart Div. (*M. Schlechter*).

Variety γ.—A third variety of *crassimanus* occurs in Carnarvon Div., Cape Colony, which is distinguished by the presence on the penultimate tarsal segment of the third and fourth legs (at least on one side of the body) of an external inferior spine, situated a little

proximal to the large intersegmental spur. This spine was absent from all our specimens of the typical form and of *variety* β. 2-lamelliform hairs are always present on the inner surface of the basal segment of the cheliceræ. This variety is represented by the following specimens :—

(*d*) 9 ad. ♀, 2 ad. ♂, and 22 juv. from Van Wyks Vlei (*D. C. Alston*): Length of cephalothorax in largest ♀ 16½ mm., in ♂ 14–15½ mm.; tarsus of fourth leg normally with three but not infrequently four spines on the outer terminal lobe; abdominal sternites in ♀ much more strongly granular than in the types, all the segments (rarely segment 1 quite smooth) granular in the middle and, in the posterior segments, also laterally (except on the lung-books), the mesial granules of the posterior segments coarse and strongly transverse,* especially in segment 5; untoothed basal portion of the scape of the pectines shorter than in the types or *variety* β, forming only ⅔ of the whole length in the ♀; anterior fork on cephalothorax generally quite absent or indistinct, sometimes quite distinct.

Opisthophthalmus nitidiceps Poc.

The Museum contains the following specimens :—

(*a*) 1 juv. from Port Elizabeth (*J. L. Drège*).

(*b*) 21 ♀ (11 ad.) and 12 juv. ♂ from Dunbrody on the Sundays River, Uitenhage Div. (*Rev. J. A. O'Neil*): Number of pectinal teeth in ♀ 12–16, in ♂ 13–20; length of cephalothorax in ad. ♀ 11½–13 mm.

The ♀ of *nitidiceps* closely resembles that of *crassimanus* in having the hands very convex above and very broad (their breadth almost equalling the length of the cephalothorax), the vesicle granular anteriorly below for a considerable extent, the scape of the pectines free of teeth at the base for some distance (⅓ of its length) and the cephalothorax very smooth, being finely granular only at the sides. It differs principally in having the infero-median keels of first and second caudal segments distinct, weakly crenular, replaced by low granules only in the anterior part of segment 1, which is weakly granular below, the last abdominal sternite mostly weakly granular, the finger-keel of pedipalps smooth or nearly so for a more or less considerable portion of its length (but generally more or less granular, or at least crenular, proximally), and the terminal tarsus of the third

* Similar granules often occur in the ♀ of *variety* β from Great Bushmanland, *e.g.*, in some of the specimens from Houmood.

and fourth legs with two (very rarely three) external spines below in addition to the four (very rarely three) spines on the terminal outer lobe. The ad. ♂ is unfortunately not known, but in the juv. ♂ the last abdominal sternite is coarsely granular, and most of the other sternites are weakly granular in the middle, while the scape of the pectines is rounded at the base behind and free of teeth for a short distance (about $\frac{1}{4}$ of its length, more or less).

The superior process of the tarsi is shorter than the terminal lobes, and the terminal tooth of the superior caudal crests is sharply conical and sometimes enlarged, sometimes not.

Opisthophthalmus chaperi Sim.

Additional locality.—1 ad. ♂, 4 ad. ♀ and several juv. from Brandvlei, Worcester Div. (*I. Meiring, W. F. Purcell*). This locality somewhat extends the known range of the species.

Opisthophthalmus fossor Purc.

*Additional localities.**—(*a*) 1 ad. ♂ from the Boschjesveld Range, overlooking Villiersdorp, Caledon Div. (*Gother Mann*).

(*b*) 1 ad. ♂ from the western end of the mountain at Caledon (*G. French*).

Opisthophthalmus macer Thor.

Additional localities.†—(*a*) 1 ad. ♂ from Hex River Valley (collected by Mr. F. Treleaven to the north of Hex River East Station): Number of pectinal teeth 21–22; colour of legs ochraceous, the tibiæ infuscated at both ends and along the upper edge; cephalothorax granular throughout.

(*b*) 5 ♀ (3 ad.) from the Venster Ravine at Caledon (*E. Watermeyer, W. F. Purcell*): Number of pectinal teeth 11–12; interocular area granular throughout or smooth behind; legs dark reddish brown.

(*c*) 1 ♀ from Houwhoek, Caledon Div. (*Mrs. W. F. Purcell*): Legs dark reddish brown.

(*d*) 8 ♀ (7 ad.) and 3 ♂ (2 ad.) from River Zonder Einde, Caledon Div. (*W. F. Purcell*): Number of pectinal teeth in ♀ 11–13, in ♂ 14–16; interocular area granular throughout (rarely somewhat smooth behind in the ♀); legs reddish brown.

* Penther (Ann. Naturh. Hofm. Wien, *v.* 15, p. 158) has recently recorded the species from the Outeniqua Mountains (George and Knysna Divs.) and Robinsons Pass (between Oudtshoorn and Mosselbay Divs.).

† Penther records this species from British Bechuanaland, which is very north of any locality from which *macer* had previously been recorded.

(*e*) 1 ad. ♀ from Elim, Bredasdorp Div. (*E. Lemmerz*): As above.

(*f*) 2 ♂ and 1 ♀ from the mountain-side at Swellendam (*H. A. Fry, W. F. Purcell*): Number of pectinal teeth in ♂ 17–18; legs reddish brown; interocular area granular (♂) or smooth behind (♀).

(*g*) 1 ad. ♂ from Witteklip near Van Stadens River, Uitenhage Div. (*J. L. Drège*): Interocular area nearly smooth behind.

Opisthophthalmus latimanus C. L. Koch.

*Additional localities.**—(*a*) 8 ad. ♀ from the vicinity of King-williamstown (*J. Wood, H. M. Chute*): Number of pectinal teeth 11–14.

(*b*) An ad. ♀ and ♂ from Graaff Reinet (*G. French*).

(*c*) 3 ad. ♀ and 1 ad. ♂ from Blue Cliff, Uitenhage Div. (*J. L. Drège*): Number of pectinal teeth 12–14.

(*d*) 1 ♀ from Hell's Gate Kloof at Uitenhage (kindly lent by Mr. F. West, of Port Elizabeth).

All the above specimens resemble those previously described from Brakkloof, the legs being dark reddish brown.

(*e*) An ad. ♀ and ♂ from Jansenville (in the Albany Museum, kindly lent by Dr. Schönland): Number of pectinal teeth in ♀ 14–16, in ♂ 19; colour as in the specimens from Brakkloof, except that of the legs, which is *pale ochraceous*.

Opisthophthalmus glabrifrons Pet.

Additional localities.—(*a*) 2 ad. ♂ and several ♀, collected about twenty miles east of Pietersburg, Zoutpansberg District, Transvaal (*Rev. J. W. Daneel*): Large; closely resembling the specimens described under (*a*) in my previous paper (p. 161).

(*b*) 1 ad. and 1 juv. ♂, collected along the Harts River, Barkly Div., Cape Colony (*Garwood Alston*): Large; closely resembling those described under (*a*) in my previous paper (p. 161), except that the finger-keel is partially smooth distally.

(*c*) 1 ad. ♂ from the Matopo District, Matabeleland (*R. Pillans*): Size and characters of the ♂ from Bechuanaland, described under (*c*) in my previous paper (p. 162).

(*d*) 2 ad. ♂ and 2 ad. ♀ from Salisbury, Mashonaland (*G. A. K. Marshall*): Rather small specimens, the ♂ resembling those from Mazoe, but the ♀ with the finger-keel more granular and the interocular area nearly smooth.

(*e*) 6 ad. ♂ from Waterberg in the north of the Transvaal

* Penther records the species from the Outeniqua Mountains (George and Knysna Divs.), as well as from various places in Albany Div.

(*R. v. Jutrsencka*), kindly lent by Dr. Gunning, of the Pretoria Museum: Number of pectinal teeth 14–19; length of cephalothorax $12\frac{3}{4}$–14 mm.; distance of eyes from anterior margin $2\frac{1}{10}$–$2\frac{1}{3}$ times their distance from hind margin; finger-keel granular in the proximal half, smooth in the distal half or third, rarely granular almost throughout its length; secondary keel of hand granular, strong distally but very weak or obsolete proximally; interocular area almost entirely smooth, or the anterior and medial part more or less roughened with very minute granulation; tarsus of fourth leg often with only three spines on the outer terminal lobe; total length 85–99 mm. These specimens closely resemble those described under (*e*) in my previous paper (p. 162), but they are larger and the colour is not reddish, the tail, legs, and pedipalps being pale yellowish to yellowish brown. (S. A. Mus. reg. no. 5076.)

Gen. HADOGENES Krpln.

Hadogenes granulatus, n. sp.

Adult ♂ (dry).—*Colour* reddish brown, the legs paler, the cephalothorax somewhat blackened laterally on each side of the interocular area; pedipalps with black crests and fingers; vesicle yellowish.

Cephalothorax broader than long, the frontal margin nearly straight, not emarginate in the middle; the upper surface very densely granular throughout, the granulation fine, except that on the sides of the cephalothorax and in the depressed area in front of the median tubercle, where it is much coarser than elsewhere and plainly visible to the unaided eye; lateral eyes small, equal, the middle eye distant about $\frac{1}{3}$ of its diameter from the anterior and almost its own diameter from the posterior eye; superciliary ridges of median eyes weakly crenular above, granular behind.

Tergites 1–6 very finely shagreened, except on the broad anterior raised borders, which are mostly nearly smooth; seventh segment as long as broad, narrowed behind but not semicircularly rounded, the upper surface finely shagreened, with coarser granulation towards the sides behind; the broad anterior raised border of the seventh segment very minutely granular, emarginate behind and provided with the usual pair of small pits at hind margin.

Sternites smooth and polished, the last segment with a pair of very large and deep apical depressions.

Tail very long, six times the length of the cephalothorax, which is equal to the first caudal segment together with slightly less than $\frac{1}{4}$ of

the second. Segment 1 depressed, wider than high, highest and widest near hind end, becoming narrower and considerably lower towards the front; the sides straight throughout the greater part of the segment but not parallel, diverging gradually from the anterior end backwards as far as the widest part near hind end, behind which the sides converge again for a very short distance; length of the segment $3\frac{1}{4}$ times the width and nearly $3\frac{2}{3}$ times the height behind; the superior keels far apart, forming a pair of low, broad, rounded, finely granular ridges but without any seriate granulation, and ending behind in a pair of low convexities; the upper surface broadly grooved medially throughout the whole length and finely granular. Surface of tail, especially on the sides, very finely granular, more coarsely so in the fifth segment. Superior keels sharply denticulate in segments 2–5, the denticles very small in the anterior part of segments 2–3, and strongest in the posterior segments, the terminal tooth slightly enlarged in segments 3–4 but not spiniform. Lateral keels strong in segment 1, nearly smooth, or weakly granular in places, abbreviated at posterior and anterior end, the sides of segments 2–5 raised convexly along the middle longitudinally but scarcely carinate. Inferior lateral and medial keels almost smooth in segment 1, very finely (but not serially) granular and irregularly roughened with pits in segments 2–3, coarsely denticulate in segment 5 (with about 12–15 large teeth in each keel).

Vesicle somewhat compressed, broader than the hind end of segment 5, the surface, especially below, very irregular, densely and rather coarsely granular (like the sides of fifth segment); upper side almost straight, being only very slightly convex in the middle, but slightly concave posteriorly before the base of aculeus.

Pectines with 22–23 teeth, the scape angular at the base behind.

Pedipalps with the fingers lobed at base; the hand slightly convex along the middle above, with the upper surface more or less reticularly granular, the granulation coarse towards the sides.

Locality.—An old specimen labelled "Rustenburg District, Transvaal" (reg. no. 420, *T. Ayres*).

Measurements.—Total length 191 (abdomen stretched, natural length probably about 185); length of cephalothorax $18\frac{3}{4}$, width $19\frac{1}{3}$; length of last abdominal tergite $12\frac{3}{4}$, width 13; length of tail 113; length of first segment 14, greatest width (behind) $4\frac{1}{3}$, height behind 4; length of second segment 21, of third segment $21\frac{1}{4}$, of fourth segment 24, of fifth segment 22, of sixth segment $11\frac{3}{4}$; width behind of fifth segment 3; width of vesicle $3\frac{1}{3}$, height $4\frac{1}{2}$; length of femur of pedipalp 18, width of upper surface (including bordering granules)

6½, length of anterior surface (measured along the middle from proximal side of large basal tooth to distal end of segment) 11½, width of anterior surface (including bordering crests) 5⅕; length of hand 32½, width 10; length of hand-back 19, of movable finger 17.

This species appears to be near *H. tæniurus* (Thor.), which was described from a ♀ specimen obtained by C. J. Andersson, who collected in Damaraland.

Order PEDIPALPI.

Phrynichus scullyi, n. sp.

Colour of the cephalothorax and pedipalps blackish brown to nearly black, the hands reddish; abdomen dark brown above, the lateral borders of the tergites, the sides and the ventral surface ochraceous; legs light brown to yellowish brown, the proximal part of the femora blackish brown. (The two small specimens altogether lighter, with brown cephalothorax and pedipalps, and brownish yellow abdomen and legs.)

Whole animal thickly granular.

Cephalothorax 1¾ times as wide as long (in the two small ex. about 1⅗ times), the subspina in front of the oc. tubercle prominently projecting.

Pedipalps very stout; the anterior face of the femur and tibia broad and flat, granular, each bordered along both the upper and the lower edges by a row of sharply conical teeth and 5–7 longer spines, the 3 distal spines of the upper edge of the tibia subequal and very long; hand with a strong, curved, conical spine (in the young ex. a large conical tubercle) at the base above, as in *Damon;* length of the femur somewhat exceeding the width of the cephalothorax in the largest specimen (less than this width in the other examples).

Localities.—(*a*) Nieuwoudtville, Calvinia Div., Cape Colony. Typical ex. (reg. no. 6,307, *E. B. Watermeyer*); length of trunk 15½, width of cephalothorax 9½, length of femur of pedipalp 8½.

(*b*) Pakhuisberg, Clanwilliam Div. (young ex., *R. Schlechter*).

(*c*) Namaqualand, Cape Colony (young ex., *W. C. Scully*).

(*d*) A large dried ex. without a history; length of trunk 19; length of femur of pedipalp 13¼, width in middle 2¼, height in middle 2⅓; width of cephalothorax 12¼.

This genus has not previously been recorded from South Africa, where the first specimen was found by Mr. Scully.

Order SOLIFUGÆ.

The known South African genera may be determined from the ollowing table :—

a. Fourth leg with a pair of terminal claws .. .. .. Fam. Solpugidæ.
  a^1. First leg without claws.
    a^2. Second and third legs with 4, fourth leg with 7 tarsal segments.
      a^3. Ocular tubercle with a number of bristles on anterior side; the metatarsus of the pedipalps without true spines, generally with a number of stout truncated cylinder-bristles below.. *Solpuga* Licht.
      b^3. Ocular tubercle with only 2 large bristles in front, behind them 2 smaller ones, all forming part of the semicircular series round the medial side of each eye; metatarsus of pedipalps with true spines below in the ♂ .. .. *Zeriassa* Poc.
    b^2. Second and third legs with 1–2, fourth leg with 1–4 tarsal segments.
      a^4. Second and third legs with 2, fourth leg with 4 distinct tarsal segments .. .. *Dazsia* Karsch.
      b^4. Second and third legs with unsegmented tarsus.
        a^5. Tarsus of fourth leg distinctly 2-jointed, the distal segment shorter than the proximal one and movably articulated to it .. .. *Blossia* Sim.
        b^5. Tarsus of fourth leg 1–2-jointed, but the distal joint not movably articulated.
          a^6. Metatarsus and tibia of pedipalp without true spines below, the metatarsus thickly studded all round with brownish-black, truncated, cylindrical bristles .. *Hemiblossia* Krpln.
          b^6. Metatarsus and tibia of pedipalp with distinct spines below .. .. *Gluviopsis* Krpln.
  b^1. First leg with a pair of small terminal claws; tarsus of second to fourth legs 2-jointed .. .. *Ceroma* Karsch.
b. Fourth leg without claws .. ..Fam. Hexisopodidæ.
  a^7. Pedipalps without spines .. .. *Hexisopus* Karsch.
  b^7. Pedipalps with strong spines .. .. *Chelypus*, n. g.

Gen. SOLPUGA Licht.*

* I have previously called attention to the fact that in some species of this genus, *e.g.*, *S. cervina* Purc. (Ann. S. A. Mus., *v.* 1, p. 415) and *S. vincta* C. L. Koch (*ibid.*, p. 420), the flagellum occupies different positions in dried and in spirit specimens, the distal part of the shaft being bent much further backwards (or downwards) in the former than in the latter case. From an examination of some living males of *S. vincta* it appears that the natural position of the recurrent portion of the flagellum when at rest is a nearly horizontal one, parallel to the upper side of the cheliceræ. On being placed in spirits the recurrent shaft immediately rises to an angle of about 45°, as drawn in fig. 23 (*loc. cit.*, p. 421).

I should also mention that the specimens doubtfully referred to on p. 401 of the paper quoted above as young of *Solpuga* have since proved to belong to the genera *Blossia* or *Hemiblossia*.

Solpuga lethalis C. L. Koch.*

Additional localities.—(*a*) Concordia, Namaqualand Div. (♂; *J. H. C. Krapohl*).

(*b*) Ashton, Robertson Div. (♂, *E. de Wet*); also Bonnie Vale Farm near Bushmans Drift on the Breede River (near Ashton), Swellendam Div. (♀, *Ch. Groom*).

Solpuga venator Poc.

Additional locality.—Dunbrody, on the Sundays River, Uitenhage Div. (3 ♂, 5 ♀, and 7 juv., *Rev. J. A. O'Neil;* also 1 ♀, *E. H. L. Schwarz* and *A. W. Rogers*). Apex of flagellum reaching to between the anterior and posterior margins of the eye-tubercle; the ♀ and juv. occasionally with a very minute additional tooth just in front of the third or intermediate tooth of the upper finger of one of the cheliceræ.

According to Kraepelin (Das Tierr., Palp. and Sol., p. 57), the ♀ of this species is distinguishable from that of *lethalis* by the possession of a number of short truncated cylinder-bristles on the ventral surface of the tibia of the pedipalp, similar to those on the metatarsus. Although this is the case in the ♀ of *venator* from Namaqualand, it is not so in the specimens from Dunbrody,† in which the truncated cylinder-bristles, although plentiful on the metatarsus, are very scarce or almost entirely absent from the under surface of the tibia in the ♀, all or almost all the short bristles on this surface being slender and notched at the apex. I know of no reliable character for distinguishing the ♀ of these two species. The best character so far appears to be the number of intermediate teeth in the single series of the upper finger of the cheliceræ.

Solpuga cervina Purc.

8 ♂ of this species were recently obtained at Steinkopf, Namaqualand Div., by Mr. M. Schlechter. The anterior of the two intermediate teeth of the upper jaw may be quite absent (as was also the case in the ♀ previously recorded by me from this place, *loc. cit.*, p. 417), or present and minute, as in the type.

* The literature of the species of *Solpuga* is given in Kraepelin, Das Tierr., Palp. and Sol., 1901.

† As no ♂ of *lethalis* has as yet been found anywhere near this locality, these ♀ cannot well be considered as belonging to the latter species.

SOLPUGA ALSTONI, n. sp.

(Fig. 1.)

♂. *Colour* brown, the under surface of the trunk and of the bases of the legs pale yellowish; fingers of cheliceræ pale yellow, reddish to black at the apex; cephalothorax along the middle and at the sides also pale yellowish; fourth leg with the apex of femur, the tibia, metatarsus, and tarsus brownish-black; malleoli infuscated at the edges; abdominal tergites brownish-black, the anterior ones broadly brown on each side, the bristles on the tergites brownish-black at base, white distally; sides of the abdomen with a narrow black stripe above but broadly dark brown below, thickly covered with soft white hairs; under surface pallid, with pallid hairs, the posteriormost segments dark brown with light brown hairs. Fourth leg with numerous, extremely long, soft, white hairs on the femur (on all sides) and on the sides and upper surface of the tibia and metatarsus; second and third legs with a small number of similar hairs on the femora and tibiæ. Pedipalps long, the tibia and metatarsus with numerous truncated bristles below, the femur with 4–5 very strong spiniform bristles below, the proximal one being shortest and extremely stout.

FIG. 1.—*S. alstoni*, n. sp.

Chelicerœ.—Upper finger straight, curved downwards but not outwards at the apex of the terminal fang, and provided below with 5 teeth in the single series, the two intermediate ones (third and fourth) very distinct; basal half of terminal fang with the upper medial edge not carinate but rounded for some distance in front of the flagellum, the middle of the fang with a short oblique keel commencing on the upper surface and ending anteriorly on the median side in a small angle. Lower finger with 2 strong curved teeth and a small intermediate one.

Flagellum.—Basal enlargement high and almost rotundate in outline when seen from the medial side, the superior edge sharp and strongly laterally compressed; procurrent portion of shaft extremely short; the anterior bend extremely short and sudden, far back,

situated over the intermediate teeth, the recurrent portion of shaft, when seen from the side, ascending directly from the upper surface of the terminal fang almost straight upwards (directed slightly backwards), and then strongly curving backwards slightly beyond its middle; seen from above and in front the recurrent portion appears doubly sinuate, being concave externally in the basal half and internally in the distal half, the basal part stout, angular, and somewhat triquetrous, the distal part slender, terete, and subulate.

Total length 24½, width of cephalothorax 4¾, length of pedipalp 25½, of tibia 8½, of metatarsus + tarsus 8½.

Locality.—1 ♂ (reg. no. 4,661) from Eities, in Gt. Bushmanland, Kenhart Div., Cape Colony, captured by Mr. E. G. Alston.

According to Mr. Alston, this species is diurnal. In general appearance, particularly as regards the colour, the hairiness of the legs, and the size, it much resembles *spectralis* Purc. It is, however, nearest related to *sericea* Poc., and belongs to the small group of diurnal species which have no wide interval between the teeth of the single series, but have the hairs of the abdominal tergites darker than those on the sides of the abdomen (*sericea*, *fusca*, &c.).

Solpuga derbiana Poc.

Locality.—Grahamstown (♂, ♀, *Rev. J. A. O'Neil*).

Solpuga lateralis C. L. Koch.

Additional locality.—Dunbrody, on the Sundays River, Uitenhage Div. (♂, *Rev. J. A. O'Neil*).

Solpuga chelicornis Licht.

Localities.—(*a*) Arabis (about 30 miles north of Concordia), Little Bushmanland, Namaqualand Div., Cape Colony (♂, *J. H. C. Krapohl*).

(*b*) Eities, near Pella, Gt. Bushmanland, Kenhart Div. (♂, *E. G. Alston*).

(*c*) Styrkraal, on the Orange River, Gt. Bushmanland, Kenhart Div. (♂, *Max Schlechter*).

I have also seen a male from Willowmore, collected by Dr. Brauns.

S. villosa Purc. (Ann. S. A. Mus., *v.* 1, p. 423, fig. 24, ♂), the locality of which is unknown, is not a distinct species, as it differs

from the ordinary *chelicornis* principally in having the flagellum shorter in length and higher at the anterior bend.

Solpuga hostilis (White).

This species has been recorded by Pocock from Pretoria and Barberton (Transvaal) and from Estcourt (Natal), and by Simon from Basutoland.

Additional localities.—(*a*) Johannesburg, Transvaal (♂, ♀, *H. A. Fry, Alex. Ross*), where the species appears to be common.

(*b*) Rietvlei, Umvoti District, Natal (♂, ♀, *H. A. Fry*).

S. cultrata, Purc. (Ann. S. A. Mus., *v.* 1, p. 427, figs. 27–27b), is merely a dark-coloured variety of *hostilis* (White).

Solpuga lineata C. L. Koch.

Additional localities.—(*a*) Dunbrody on the Sundays River, Uitenhage Div. (♂ and juv., *Rev. J. A. O'Neil*): Pedipalps and first leg with black stripes.

(*b*) Between Montagu (Robertson Div.) and Barrydale (Swellendam Div.), (♂, *Isaac Meiring*): Pedipalps and first leg with black stripes.

This species is diurnal, the ♂, ♀ and juv. having been observed running about in the sunshine, often, especially in the case of the ♂, with great rapidity (*L. Péringuey, Rev. J. A. O'Neil, I. Meiring*). Some very interesting observations concerning its habits were made by the Rev. J. A. O'Neil, who discovered examples of the ad. ♂, ♀ and juv. on a number of occasions in the nests of *Termes unidentatus* Wasm., sometimes as much as three feet underground. A couple of females kept in captivity for a few days by Mr. O'Neil devoured in that period some hundreds of workers and soldiers of *T. unidentatus*.*

Gen. BLOSSIA Sim.

Blossia namaquensis, n. sp.

(Fig. 2.)

♂. *Colour* pale yellowish; the tibia, apex of femur and base of metatarsus of fourth leg tinged with reddish brown: pedipalps pale yellow; cheliceræ, cephalothorax, dorsal surface of abdomen, the legs in part and the proximal portions of the pedipalps thickly covered with very short, erect, apically notched or truncated cylinder-

* Kraepelin mentions that *Solifugæ* in general feed principally on termites (Das Tierr., Palp. and Solif., p. 9).

bristles, the distal portion of the pedipalp and of the legs and the under side of the abdomen thickly covered with longer, slender, apically notched, cylindrical bristles.

Cheliceræ with a number of apically notched or blunted spines on the upper and outer surfaces, the long posterior ones of the upper surface arranged in an oblique row; distal part provided with long slender bristles on each side, the dorsal surface with a long horizontal distal bristle, which, rising close behind the insertion of the flagellum, becomes gradually thinner towards the apex and is covered with very minute spinules in its distal part. Upper finger strong, evenly curved, with two large, pointed, distal teeth placed as far from the apex as the distal tooth of the lower finger, and followed by a rudimentary intermediate tooth, a large fourth tooth, and several smaller teeth. Lower finger with two large pointed teeth and a very minute intermediate one between them.

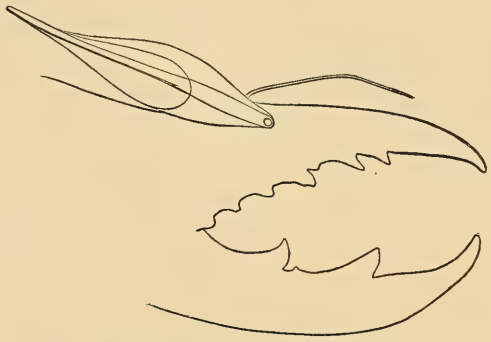


Fig. 2.—*B. namaquensis*, n. sp.

Flagellum lanceolate (seen from the side), the apex long and slender, the opening on the inner side large, the basal part hollow, gradually narrowing anteriorly, but not petiolate, rotatably attached at the anterior end to the inner side of the upper finger behind the level of the third large tooth of the single series; the flagellum is membranous and transparent, its surface is thickly studded with minute prickles right up to the apex, and the lateral wall is furnished along its middle with a thick, pale yellowish, longitudinal rib extending throughout the whole length.

Cephalothorax with a few, very short, brown spines scattered amongst the very numerous, short, cylindrical bristles; the hind margin, like that of the thoracic segments, with a row of longer notched spines.

Tergites of abdomen with some short scattered spines, which are replaced in the posteriormost segments by longer cylindrical bristles. Second abdominal segment provided below with two clusters, each consisting of a pair of long, slender, filiform, contiguous, reddish hair-structures, and curved backwards and towards the median plane, but not meeting the adjacent cluster.

Pedipalps with several stout spines below, hidden amongst the cylinder-bristles on the tibia and metatarsus; the cylindrical bristles on the dorsal surface of the tibia very short in the basal two-fifths, but much longer in the distal three-fifths of the segment.

Total length $11\frac{1}{4}$, length of pedipalp $12\frac{1}{2}$.

Locality.—1 ♂ from Steinkopf, Namaqualand Div. (*M. Schlechter*).

Blossia unquicornis, n. sp.

(Fig. 3.)

♂. *Colour* pale yellow to reddish, the cephalothorax at the sides, the abdominal tergites and in one specimen, also, the metatarsus of the pedipalps and the fourth leg in places, more or less marked with dark brown or reddish brown, the anterior margin of the cephalothorax also more or less darkened; the very short cylindrical bristles on the limbs and body reddish, giving the whole animal a reddish tinge.

Cephalothorax and *abdominal tergites* as in *namaquensis;* the second abdominal segment provided below with two clusters of acute, sickle-shaped, rather thick and fleshy, reddish hair-structures, each cluster composed of two such hairs and meeting the adjoining cluster distally in the median plane.

Pedipalps with several short spines below among the long cylinder-bristles of the tibia and metatarsus, the dorsal surface of the tibia with very short cylindrical bristles throughout.

Cheliceræ thickly covered with strong spines; the distal dorsal bristle strongly curved, thick at the base but becoming rapidly thinner and filiform, the slender portion covered with minute fine spinules. Upper finger strong, directed upwards and straight at first, but curving downwards towards the apex; the 5 distal teeth large, especially the first and the fourth, followed on the outer side by a row of other large teeth belonging to the double series; the distal tooth nearer the apex of the fang in the upper than in the lower finger; lower finger with 2 large teeth, and a small but not very minute one between them.

Flagellum membranous, broadly spathulate; the distal part broad,

densely covered with shaggy hairs, very obtuse at the apex; the proximal part narrowed and hollow, rotatably attached at its anterior

IG. 3.—*B. unguicornis*, n. sp.

end to the inner surface of the upper finger behind the level of the large fourth tooth; outer wall of flagellum furnished with a strong yellowish axis, which terminates distally in a short and sharp claw.

Total length $9\frac{1}{2}$–$12\frac{1}{2}$.

Locality.—2 ♂ from Dunbrody on the Sundays River, Uitenhage Div., Cape Colony (*Rev. J. A. O'Neil*).

A nocturnal species, closely allied to *namaquensis*.

Blossia crepidulifera, n. sp.

(Fig. 4.)

♂. *Colour* pale yellow; the cephalothorax minutely, but in places only very faintly reticulated with dark brown over its surface; the tarsus, metatarsus, and the apex of tibia and of femur of the pedipalps (in ♂ from Touws River the apex of the pedipalps only) faintly tinged with brown or reddish brown.

Cheliceræ with numerous, rather slender spines; the distal dorsal bristle straight, its distal half minutely echinated on its surface but not slenderer than the proximal half, pointed at the apex. Dorsal finger conical in the basal half, then slightly bent downwards and continued into the slender, straight, distal half; the latter curved downwards at the tip, with the lower edge somewhat dilated and provided with 3 subequal, saw-edge-like teeth, the posterior edge of the second being longer than that of the first, and that of the second much longer still; conical basal half of finger with 2 distal teeth, of

which the posterior one is largest and terminates the single series, being followed posteriorly by a double row of about 3 outer and 3 inner teeth. Ventral finger only slightly curved, except at the apex, with 3 sharp teeth, the middle tooth small; the upper edge of the finger slightly convexly elevated for some distance in front of the distal tooth.

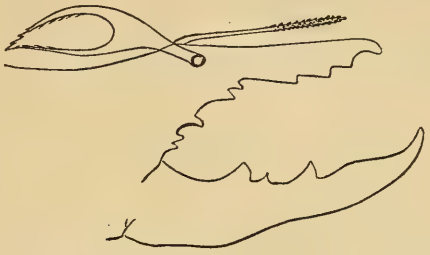


Fig. 4.—*B. crepidulifera*, n. sp.

Flagellum membranous, transparent and colourless, without longitudinal rib, the large opening directed inwards, the superior edge more convex than the lower edge, the distal end pointed; the free edges of the opening lacerated distally, only a little involuted above and below; anteriorly the flagellum is hollow and rotatably attached by a narrow stalk to the inner side of the upper finger just behind the level of the large posterior tooth of the single series.

Cephalothorax provided with a few medium-sized spines near the sides and in front scattered amongst the very short and numerous cylindrical bristles, the row at the hind margin composed of longer and slenderer spines than in *namaquensis*.

Abdomen.—The 2 clusters of hairs on under surface of second segment meeting distally in the median plane to form an arch, each cluster composed of 3 long, contiguous, filiform, curved hair-structures.

Pedipalps with the spines on the under surface of the tibia slender, those on the metatarsus not distinctly distinguishable from the long cylinder-bristles of the under surface.

Total length $8\frac{1}{4}$–$10\frac{1}{2}$.

♀. A few ♀ or young from the Worcester District, probably belonging to this species, differ from the ♂ in having much shorter limbs, while the longer spines of the upper surface of the body are replaced by slenderer cylindrical bristles. The dentition is normal, the single series being composed of 2 large teeth, followed by a small one, and another large one. The spines on the ventral side of the pedipalps are shorter and distinct, even on the metatarsus, which is

tinged with reddish brown throughout. No fleshy hairs on second abdominal segment.

Localities.—(*a*) 1 ♂ (type) from Robertson, Cape Colony (*W. F Purcell*).

(*b*) 1 ♂ from Touws River Station, Worcester Div. (*W. F. Purcell*).

(*c*) 1 ♀ from Worcester (*R. M. Lightfoot*).

(*d*) 2 ♀ or juv. from Brandvlei, Worcester Div. (*I. Meiring*).

Found hiding under stones in the daytime.

Blossia karrooica, n. sp.

(Fig. 5.)

♂. *Colour* pale yellowish ; the cephalothorax towards the sides, the distal segments of the pedipalps and a considerable portion of the fourth leg more or less faintly tinged or marked with dark brown ; the cheliceræ with 1 lateral and 2 dorsal darkish lines.

Cephalothorax with some long, notched, cylindrical bristles instead of spines near the sides and in front, and a row of still longer ones at the hind margin.

Abdominal tergites with some stout notched bristles or slender spines on anterior segments ; second abdominal segment below with 2 clusters of 3 fleshy hairs each, almost meeting distally in the median plane, the hairs long, filiform and curved.

Pedipalps with the cylindrical bristles on the dorsal surface of the tibia as long as those on the metatarsus ; the ventral surface of each of these segments with 3 long, strong, very distinct, equidistant spines in their middle part.

Cheliceræ with numerous shorter and longer, mostly apically notched bristles instead of spines ; the distal dorsal bristle curved, its proximal half stout and minutely granular (except at the base), the distal half slenderer, subulate and smooth. Dorsal finger with the superior edge slightly convex and the lower edge almost straight, the tip of the finger curved sharply downwards and tooth-like ; the 3 distal teeth largest, the first laterally compressed, obtuse and very near the apex of the finger, followed closely by the second tooth, the second and third teeth pointed, with long posterior edges, the fourth and sixth teeth small with the larger fifth tooth between them, followed by several other teeth of the double series ; on the outer surface of the finger just at the base of the distal tooth is a sharp external tooth, distinctly visible from above. Ventral finger with 3 pointed teeth in its middle part, the intermediate tooth small ; in front of these is a large outer tooth with long, straight, posterior

edge, and an inner lamina with rounded edge rising from the inner edge of the upper surface of the finger.

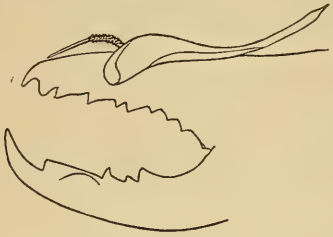


Fig. 5.—*B. karrooica*, n. sp.

Flagellum slender, transparent, with slight sigmoid flexure (seen from the side), the basal half narrow and only slightly inflated, the anterior end obtuse and rotatably attached to the inner surface of the dorsal finger on a level with the small fourth tooth; the flagellum narrowing gradually posteriorly, the distal half slender, suddenly accuminate at the apex (seen from the side).

Total length 9.

♀. Limbs much shorter, but with less dark brown than in the ♂; the bristles on the cheliceræ (except the distal dorsal one) and on the cephalothorax and the spines on the tibia and metatarsus of the pedipalps similar to those of the ♂, but somewhat shorter, the spines strong; upper finger of cheliceræ normal, with 4 teeth in the single series, of which the third is small and the first, second, and fourth large, followed by a double series of 3 outer and 3 inner teeth. Lower finger with 2 large teeth and a small one between them.

Locality.—1 ♂ and 1 ♀, found under stones on karroo-kopjes at Prince Albert, Cape Colony (*W. F. Purcell*).

This species appears to be closely allied to *B. setifera* Poc.

Gen. HEMIBLOSSIA Krpln.

Hemiblossia o'neili, n. sp.

(Figs. 6, 7.)

♀. *Cephalothorax* blackish-brown, mostly paler and more yellowish in the central area, the surface thickly studded with numerous, very short, pale yellowish to blackish brown, pointed and truncated bristles, amongst which are scattered a number of longer blackish brown ones.

Thorax above and the *abdominal tergites* pale yellowish or

whitish, with numerous, colourless, apically notched, cylindrical bristles and a small number of longer blackish brown ones; the soft skin on the sides blackish brown, sharply marked off from the pale yellowish or whitish under surface, which is thickly covered with pale notched bristles.

Pedipalps blackish brown, the tip of the tarsus sometimes yellowish, the trochanter pale and more or less tinged with dark brown, the metatarsus thickly clothed on all sides with erect, truncated, almost black cylinder-bristles, with some longer dark brown bristles scattered amongst them, but without pointed spines; the rest of the limb, including the coxa, with mostly dark brown bristles, the outer and dorsal surface of the tibia with a coat of short truncated or notched cylindrical bristles.

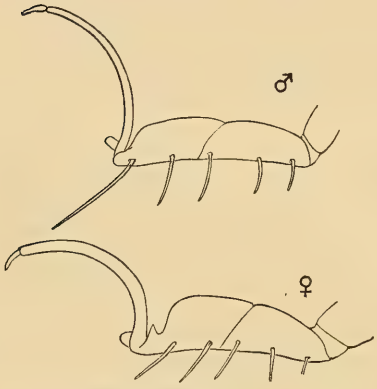


FIG. 6.—*Hemiblossia o'neili*, n. sp.; tarsus of fourth leg of ad. ♂ and ♀, seen from the side (the segmentation is much too distinctly marked in the figure).

FIG. 7.—*Hemiblossia o'neili*, n. sp. chelicera of ♂ from medial side.

Legs entirely pale yellowish or more or less tinged with blackish brown, with numerous colourless shorter bristles and a smaller number of longer dark brown ones; tarsus of fourth leg short, the thick part a little more than three times as long as high, often indistinctly divided by a transverse dorsal groove and by fine oblique lateral lines into 2 equal but not movably articulated segments, the dorsal groove sometimes obsolete and the tarsus then apparently unsegmented; femur of fourth leg thick, about $2\frac{1}{3}$ times as long as high. Malleoli broadly black-edged.

Cheliceræ blackish-brown, with a lateral and 2 dorsal darker stripes; the upper finger strong, curving downwards distally, the

2 distal teeth strong, the third smaller but not minute, the fourth larger than the third and followed by 3 smaller outer teeth and 3 inner teeth of the double series; lower finger with 2 large teeth and a small one between them.

♂. *Pedipalps.*—The truncated cylinder-bristles on the metatarsus extremely dense and numerous, blackish brown, the shorter bristles on the rest of the limb (tibia to coxa) mostly whitish.

Legs.—Tarsus of fourth leg longer, 4–5 times as long as high and mostly more distinctly bisegmented. Femur of fourth leg about three times as long as high.

Chelicerœ with the dentition very similar to that of the ♀, except that the lower finger is provided with a low elevation on the inner side near the apex.

Flagellum strongly laterally compressed, almost semicircular in outline, the upper part laminate, with sharp and convex upper edge, the lower part slightly inflated and hollow in the middle, with a narrow opening on the inner side below; anteriorly the flagellum becomes narrower and is rotatably attached at the obtuse anterior end to the inner side of the upper finger slightly behind the level of the large second tooth; the apex produced into 2 large horns forming a crescent, the superior horn hairy.

Total length of ad. ♂ $6\frac{1}{4}$–$9\frac{3}{4}$, of largest ♀ $13\frac{1}{2}$.

Locality.—Several ♂ and ♀ specimens found running about in the sunshine by the Rev. J. A. O'Neil at Dunbrody, on the Sundays River, Uitenhage Div., Cape Colony (Nov., Dec.).

In the ♀ specimen of *H. bouvieri*, Krpln. (Upper Zambesi), upon which the genus was founded, the fourth tarsus, according to Kraepelin, is unsegmented and at most three times as long as high, but the ♂ is not known. The characteristic colouration of *bouvieri*, however, very closely resembles that of *o'neili*, which is of the diurnal type, while the *Blossiœ* are nocturnal.

Gen. GLUVIOPSIS Krpln.

Gluviopsis australis, n. sp.

(Fig. 8.)

♂. *Colour.*—Chelicerœ pale yellow, with some dark brown lines and reticulation; cephalothorax dark brown, the central area reticulated, the median line pale yellow, the eyes black; abdominal segments pale yellow, bordered with dark brown along the hind margins above, the posterior segments finely reticulated with brown

over the surface; pedipalps purplish brown, but the basal segments, the proximal half of the femur and the proximal two-thirds of the metatarsus, pallid; legs pallid, but the fourth pair with the femur in its distal part and the tibia and metatarsus towards the middle more or less darkened with purplish brown: under surface quite pale.

Chelicerœ spined on upper and lateral surfaces. Upper finger straight, horizontal, curving downwards at the apex; its lower edge almost straight, with 4 large teeth in the single row, the third being only slightly smaller than the rest, the double series composed of 3 minute teeth in the outer row and one small posterior and 2 large anterior teeth in the inner row, the latter separated from the single series by a small interspace. Lower finger slightly curved, more curved at the apex, with 3 teeth, of which the anterior is the largest and the middle one minute.

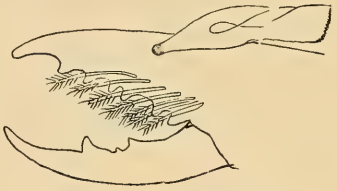


Fig. 8.—*G. australis*, n. sp.

Flagellum inflated in the middle, with a small oval opening on the inner surface, attenuated anteriorly and rotatably attached at its anterior end to the medial side of the dorsal finger above the space between the fourth and fifth teeth, the distal part strongly compressed and bent outwards, colourless, membranous, very broadly subtruncated and lacerated at the apex.

Pedipalps long and strong, with some truncated cylinder-bristles below; the femur spindle-shaped, with a row of 3 spines below, of which the 2 proximal ones are small and the distal one larger; the tibia nearly straight above but dilated below, the lower surface with 2 rows of very stout spines, viz., 2 inner and 3 * outer ones, in the distal half, the outer row supplemented proximally by a weak fourth spine; the metatarsus attenuated at the base, with 2 rows of short spines below, the inner row of 4 with the proximal spine in the middle of the segment, the outer row of 5 with the proximal spine situated proximally to the middle, the distal spine of both rows placed at the apex of the metatarsus.

* The proximal one is broken off, but marked by a scar in the only pedipalp present.

Cephalothorax strongly produced in front, the apex slightly truncated in front of the large eyes and bearing 2 spines; the upper surface covered with a number of short obtuse spinules, with some longer spines at the sides and along the hind margin.

Abdomen with some short spines on the dorsal surface and a row along the hind margin of the tergites; ventral surface with numerous apically notched, cylindrical bristles, the second and third segments each with 2 clusters of obovate, apiculate, fleshy hair-structures, 2 in each cluster, near the hind margin, the fourth and fifth segments with a long transverse row of longer and much narrower oblanceolate, pointed bristles.

Total length $7\frac{3}{4}$, length of pedipalps $8\frac{3}{4}$, of fourth leg 10.

Locality.—1 ♂ from Styrkraal, near the Orange River, in the northern part of Kenhart Div., Cape Colony (*Max Schlechter*). No species of this genus has been previously recorded from South Africa.

Gen. HEXISOPUS Karsch.

Hexisopus lanatus (C. L. Koch).

Additional Locality.—3 ♂ from Bladgrond, Great Bushmanland, in N.W. of Kenhart Div., Cape Colony (*Max Schlechter*). In these specimens the rim of the cup which forms the base of the flagellum is straight or nearly so, the procurrent portion of the shaft is not distinctly keeled below, and the ocular tubercle is shorter and less conical in front.

In the ♂ from Grasmond, described in a previous paper (Ann. S. A. Mus., *v.* 1, pp. 385–386, fig. 6), the upper rim of the cup is slightly bent downwards, so as to partially cover the opening, as shown in the figure, while the procurrent portion of the shaft is distinctly keeled below.

The recurrent portion of the flagellum appears to be evenly rounded above in all the specimens (not feebly sulcate above, as previously stated on p. 386). The dorsal finger of the cheliceræ of the ♂, also, is provided on its inner surface from above the base of the flagellum to the base of the red terminal fang with a number of very short, mostly blunted, pale or reddish spines, the distal ones longer and very dense, forming a tooth-like tuft which is situated on a level with the distal edge of the granulated oval area.

The length of the segments of the claws is very variable, the basal segment being sometimes much longer (♂ from Bladgrond), some-

times subequal to or even much shorter than the apical segment (specimens from Little Bushmanland).

Hexisopus reticulatus, n. sp.

(Fig. 9.)

♂. *Colour.*—Cheliceræ yellow, with fine infuscate reticulation on the sides and above, the terminal fang reddish at the base, black at the apex (one of the cheliceræ with a lateral and two dorsal, longitudinal, infuscate stripes uniting distally, these stripes partly obsolete on the other chelicera). Cephalothorax blackish brown, with a narrow, sharply marked, yellow border at the lateral and anterior margins, and a large, three-leaved, yellowish, reticulated mark in the centre ; the surface covered with long, soft, white hairs and sparsely distributed, short, dark brown bristles. Thoraco-abdomen infuscate above at least in the anterior segments, covered with long, soft, white hairs, the anterior edge with some short, dark brown ones in addition. Legs and pedipalps pale yellow.

Cheliceræ.—Upper finger evenly curving downwards towards the apex, the terminal fang rather pointed, scarcely curved outwards, flattened externally, dilated internally at the base in the same manner as in *lanatus ;* teeth of the upper finger as in the description of *lanatus* (Ann. S. A. Mus., *v.* 1, p. 385). Lower finger long, slender, strongly curved, with a small tooth behind the middle. Inner side of upper finger provided with a distal tooth-like tuft of reddish spines, similar to those in *lanatus* (p. 221 above).

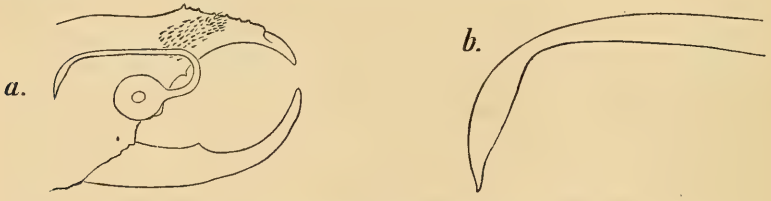


Fig. 9.—*H. reticulatus*, n. sp. ; *a*, left chelicera from medial side ; *b*, apex of flagellum more magnified.

Flagellum.—Basal cup large, equalling the procurrent portion in length ; the shaft cylindrical, curved semicircularly at the anterior bend, then straight for some distance and strongly curved downwards again at the apex, the apical portion strongly compressed, blade-like, slightly dilated and sharp-edged below and ending in a point at some distance behind the basal cup.

Pedipalps.—Metatarsus with numerous long hairs and short truncated cylindrical ones along its whole length.

Locality.—One ♂ found by Mr. M. Schlechter near the Orange River, between Bysteek and the Great Falls at Aughrabies, Kenhart Div., Cape Colony. Total length 11¼ mm.

Resembling *H. nigrolunatus* Krpln. in the dark colouration, but the structure of the lower finger of the cheliceræ is quite different.

Gen. CHELYPUS, nov.

The ♂ differs from that of *Hexisopus* * principally as follows :—

Fourth leg with the 3 distal segments extremely broad (the 2 distal ones broader than long), bluntly angular along the outer edges ; the metatarsus broader than the tibia, subequalling the latter in length along the outer inferior edge and longer than the tarsus, its distal part strongly compressed from below; the tarsus very strongly flattened from below and above, almost discoid in shape, with a very narrow outer side bearing a row of 5–6 short, broad, blunt spines ; inferior surface of the 5 distal segments, as well as the external surface of the tibia and metatarsus, hairless but densely covered with extremely abbreviated, dentiform or granuliform spinules, the hind margin of the 2 femoral segments with longer spines. *Third leg* with the tibia and the distal segment of femur triquetrous, their posterior surface flattened, hairless and densely covered with strongly abbreviated spinules similar to those on the fourth leg, those along the upper and lower edges longer, particularly on the tibia, the tibia strongly dilated below, its thickness (measured dorso-ventrally) much greater than that of the distal femoral segment. *Claws* of second and third legs composed almost entirely of the distal segment, the proximal segment extremely short and indistinctly marked off. Distal segments of *pedipalps* strongly spined. *Chelicerœ* without stridulating ribs on the inner surface, which is furnished instead with a large smooth area marked with some fine and quite

* Kraepelin's nomenclature for the segments of the legs (Das Tierr., Palp. & Sol., p. 7, fig. 8) is preferable to that previously used by me (Ann. S. A. Mus., vol. i. p. 382, fig. 1), and will be adopted here. All the legs in *Hexisopus*, therefore, are considered as having only one tarsal joint (not counting the minute apical piece bearing the claws), which is preceded by the metatarsus, the tibia, and the distal and proximal femoral segments. The 4 distal segments are directed forwards in the second and third legs, but backwards in the fourth leg, and the spinous outer surface of these segments correspond, therefore, to the posterior surface in the former legs but to the anterior surface in the latter leg.

irregular furrows. Ocular tubercle and anterior half of *cephalothorax* densely covered with reddish granules (abbreviated spinules). Upper lobe of *rostrum* as long as the lower lobes.

In *Hexisopus* the 3 distal segments of the fourth leg are terete or only slightly compressed and without angular edges, the tibia is much longer than wide and subequal in length to the 2 distal segments together, the metatarsus is narrower than the tibia and the tarsus narrower than the metatarsus, each of them being also longer than wide. The tibia of the third leg is terete and much slenderer than the femur. The pedipalps are not spined, the inner surface of the cheliceræ is provided with a number of parallel stridulating ribs, and the upper lobe of the rostrum is much shorter than the lower lobe.

Chelypus barberi, n. sp.

(Fig. 10.)

♂. *Colour* reddish yellow to pale yellow, the cheliceræ with a pair of darker marks at the base above, terminal fang and lower finger reddish black at the apex, the cephalothorax with a large, faintly infuscated, oval ring on each side of the tubercle, the latter blackened round the eyes; all the spines and spinules, including the granuliform ones, reddish, the soft silky hairs pale yellowish.

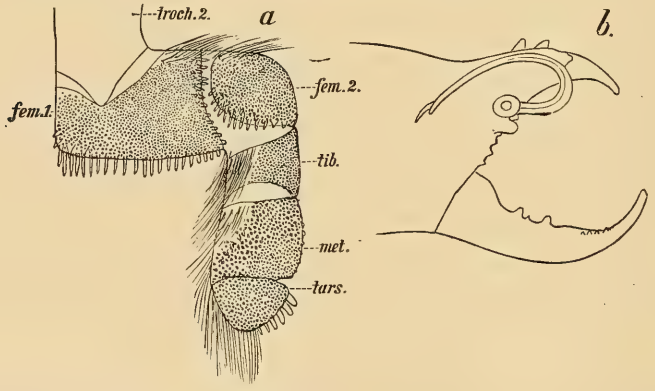


Fig. 10.—*C. barberi*, n. sp.; *a*, left fourth leg from below; *b*, left chelicera from medial side.

Pedipalps.—Tarsus with a superior, distal, transverse row of 4 stout spines; the metatarsus with several short oblique rows of 2, 3, and 4 stout spines above, below, and on the sides, the inferior

surface with stout setæ in addition ; the tibia with some stout distal spines on the sides and below ; the upper surface of the tibia and of the proximal part of the metatarsus densely covered with abbreviated granuliform spinules.

Cheliceræ hairy, the upper surface densely covered with minute pointed spinules. Upper finger furnished internally with several, short, stout spines, the dorsal surface with a small, distal, oval area containing 2 very large, black tubercles ; the terminal fang curving downwards, laterally compressed, furnished with a large basal tubercle on the inner side above ; inferior surface of finger with a large inner tooth behind the middle and an outer row of 5 small teeth, the distal tooth very remote from the apex. Lower finger strongly upcurved distally, with a moderate-sized tooth in the middle, another similar one behind the middle, and a very minute tooth between these two, the upper edge provided further with a low outer keel and a row of minute inner teeth in front of the other teeth.

Flagellum, as in *Hexisopus*, rotatably attached by a cup-like basal enlargement just above the large inner tooth of the dorsal finger, the shaft at first procurrent, then curving upwards, then backwards, and finally downwards, terminating a little behind the basal cup, the apex bifid, the medial branch short and tooth-like, the lateral branch longer and subulate.

Total length 30 mm.

Locality.—One ♂ found by Mr. Barber under a bush in British Bechuanaland about 100 miles south of the junction of the Moshowing with the Molopo Rivers.

X.—*Description of a new Silurid Fish of the genus* Gephyroglanis, *from South Africa.*—By G. A. Boulenger, F.R.S.

(Plate XIII.)

The collection of South African fresh-water fishes in the Cape Town Museum, which has been entrusted to me for naming by Mr. Sclater, contains two examples of a Cat-fish from the Vaal River, which pertain to a new species referable to the remarkable genus *Gephyroglanis* recently established by me for a fish from the Congo, *G. congicus*,* and to which two species have since been added, viz., *G. longipinnis*,† likewise from the Congo, and *G. ogoensis*,‡ from the Ogowe.

This addition to the family *Siluridæ*, so poorly represented in the fresh waters of South Africa, is of particular interest from the close relationship of the new species, which I propose to name in honour of Mr. W. L. Sclater, to those of the Congo and Ogowe basins. In the following synopsis I have contrasted the characters by which the four species may best be distinguished, and it will be observed that these characters are comparatively slight.

I. Maxillary barbel not more than $\frac{3}{5}$ length of head; nasal barbel extremely short; folded dorsal fin not extending to the adipose.

Anal with 8 branched rays; adipose fin a little shorter than rayed dorsal; caudal with acutely pointed lobes; occiput feebly granulate .. .. 1. *G. congicus*, Blgr.

Anal with 10 branched rays; adipose fin a little longer than rayed dorsal; caudal with acutely pointed lobes; four longitudinal ridges on the vertex; occiput strongly rugose .. .. 2. *G. ogoensis*, Pellegr.

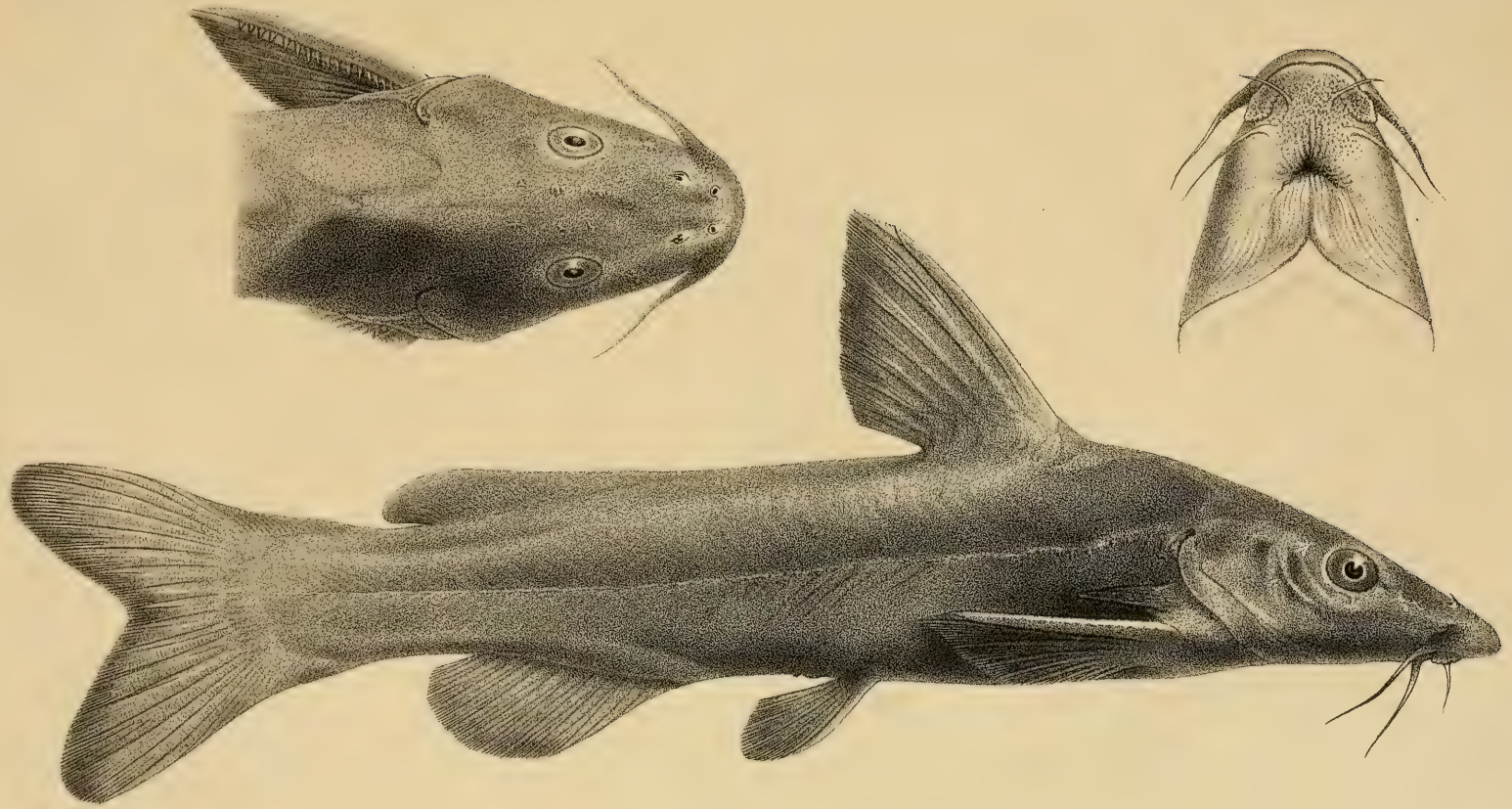
* Ann. Mus. Congo, Zool. I., p. 42, pl. xx., fig. 2 (1899).
† *Op. cit.*, p. 109, pl. xli., fig. 4.
‡ Pellegrin, Bull. Mus., Paris, 1900, p. 179.

Anal with 11 branched rays; adipose fin longer than rayed dorsal; caudal with obtuse lobes; head smooth	3. *G. sclateri*, Blgr.
II. Maxillary barbel $\frac{3}{4}$ length of head; nasal barbel $\frac{1}{3}$ to $\frac{1}{2}$ diameter of eye; folded dorsal reaching adipose, which is shorter; anal with 8 or 9 branched rays; caudal with acutely pointed lobes; vertex and occiput strongly striated and granulate	4. *G. longipinnis*, Blgr.

GEPHYROGLANIS SCLATERI, sp. n.

Depth of body $5\frac{2}{3}$ times in total length, length of head 4 times. Head $1\frac{1}{4}$ to $1\frac{1}{3}$ as broad as deep, $1\frac{1}{4}$ to $\frac{1}{3}$ as long as broad, perfectly smooth; snout obtusely conical, $\frac{2}{5}$ length of head; eye, 5 to $5\frac{1}{2}$ times in length of head, $1\frac{1}{3}$ to $1\frac{1}{2}$ in interocular width; occipital process much longer than broad, in contact with the interneural shield, which is triangular and shorter. Nasal barbel very short, barely $\frac{1}{3}$ diameter of eye; maxillary barbel $\frac{2}{5}$ to $\frac{1}{2}$ length of head, outer mandibular $\frac{1}{4}$, inner $\frac{1}{5}$. Mouth, $\frac{1}{3}$ to $\frac{2}{5}$ width of head; præmaxillary band of teeth concentric, nearly 4 times as long as broad. Dorsal 17, $1\frac{2}{3}$ to twice as deep as long, not reaching adipose fin when folded; spine strong, smooth, $\frac{2}{3}$ to $\frac{4}{5}$ length of head; longest soft ray a little shorter than head. Adipose fin about 3 times as long as deep, shorter than its distance from the dorsal. Anal 16 (11 rays branched). Pectoral spine a little shorter than the dorsal, with 9 to 15 strong teeth on its inner border. Ventral not reaching origin of anal. Caudal bifid, with obtuse lobes, shorter than the head. Caudal peduncle $1\frac{1}{3}$ as long as deep. Muciparous canals expanding into rosettes on the head and produced into raised tubules on the anterior part of the lateral line. Uniform brownish.

Two specimens from the Vaal River, the larger measuring 190 millimetres, the smaller 98; of these the larger (Reg. No. 4708) is preserved in the collections of the South African Museum, the smaller has been presented to the British Museum.



P. J. Smit ad nat. lith

West, Newman imp.

Gephyroglanis sclateri.

XI.—*On a Further Collection of South African Slugs, with a Check-list of Known Species.*—By Walter E. Collinge, *Lecturer on Zoology and Comparative Anatomy in the University of Birmingham.*

(Plate XIV.)

For the facilities to examine the present interesting collection of South African Slugs, I am indebted to the kindness of Mr. R. M. Lightfoot, of the South African Museum.

In a previous paper * I pointed out that probably many new species awaited discovery, and the present collection made by Dr. F. Purcell adds a further species to that interesting genus *Apera*, Heyn., and also a new species of *Oopelta*.

Mr. Lightfoot has very kindly sent me some notes relating to the natural colours and variation of the different species, which are of much value ; these I have incorporated in the present paper.

Family **LIMACIDÆ**, Leach.

Gen. LIMAX, L.

Limax maximus, L.

All the specimens are immature, the largest measures 63 mm. and the smallest 44 mm. in length. There are five specimens, and the colouring and markings seem to be subject to very little variation. Externally they remind one very much of some of the Italian forms. I have little doubt but that this is subspecifically distinct from the *L. maximus*, L.

Hab. Table Mt., Newlands, F. Purcell and R. Lightfoot, 6982.† "Found under rocks some distance up Table Mt." (R. M. L. *in litt.*).

* Ann. S. Afr. Mus., 1900, vol. ii., pp. 1–8, pls. 1–11.

† These figures refer to the registered numbers of the specimens in the South African Museum Collection.

Gen. AMALIA, Moq.-Tand.

Amalia gagates, Drp.

Although exhibiting some slight anatomical differences from the European *gagates*, these are not of sufficient importance to warrant separation from that species. Like the specimen previously recorded (*op. cit.* p. 2), these are all dark coloured. "The common slug on all the mountains round Cape Town" (R. M. L. *in litt.*).

Hab. Cape Town, R. M. Lightfoot, 6983, 6984; Ashton, Robertson Div., F. Purcell, 6990; Storms Vley, Swellendam Div., F. Purcell, 6991.

Family **TESTACELLIDÆ**, Gray.

Gen. APERA, Heyn.

Apera purcelli, n. sp.,

Plate XIV., figs. 1, 2.

Animal limaciform, broader anteriorly than posteriorly, dorsally bluish-black, slightly lighter at the sides. No trace of keels. Radiating lines from respiratory orifice plainly marked, the two mid-dorsal ones prominent. Peripodial groove faint. Foot-fringe and foot-sole (in alcohol) whitish-yellow ["ferrugineus," R. M. L. *in litt.*], not differentiated into median and lateral plains. Rugæ large. Length (in alcohol) 25 mm.; breadth of foot-sole, 4 mm.

Hab. Table Mt., Cape Town, R. M. Lightfoot, 5642.

This is probably an immature specimen, but there can be little doubt of its distinctiveness from *A. gibbonsi*, W. G. Binn., *A. burnupi*, E. A. Sm., or *A. natalensis*, Cllge. I hope further specimens may be obtained in order that the anatomy may be figured and described.

Family **ARIONIDÆ**, Gray.

Gen. OOPELTA, Mörch.

Oopelta aterrima, Gray.

The type of this species is in the British Museum, and through the kindness of Mr. Edgar A. Smith I have recently had an opportunity of examining it. The original label has written on it "*Limax* (*Arion*) *allerian*, S. Africa." Later some one has written "*Girasia*" (!) and Prof. Cockerell "*Oopelta ??*" and "*Arion*" *aterrimus*, Gray.

In the Collection of Slugs in the Zoological Museum of the University of Copenhagen there are exactly similar specimens, excepting in size, from Guinea, labelled *O. nigropunctata*, Mörch.

With regard to the specific name, I cannot find that Gray ever published the name *allerian; aterrima* must therefore stand.

The following description of the type may possibly lead to its rediscovery in South Africa.

Arion aterrimus, Gray, Cat. Pulm., 1885, p. 55.

"*Arion*" *aterrimus*, Gray, Cockerell, Ann. Mag. N.H., 1890, p. 387.

Animal entirely black. Body marked by a series of oblique, backwardly directed furrows 2–2·5 mm. apart. Mantle oval, granulated, particularly so anteriorly, posteriorly produced and bluntly angled. No trace of keel or caudal mucous pore. Peripodial groove distinct. Foot-fringe and foot-sole black, no lineoles or divisions into median and lateral planes. Length (in alcohol), 40 mm.; mantle, 23 mm.; breadth of foot-sole, 12·5 mm.

It is only fair to state that Prof. Cockerell (*op. cit.*, p. 388 *) was the first to suggest that this might possibly belong to Mörch's genus *Oopelta*.

Oopelta flavescens, Cllge.

This is a much more variable species than I originally thought. "The head in some specimens is a bright orange; these have a narrow yellow line from the dorsal part of the mantle to the tip of the tail. Foot-fringe and foot-sole light yellow, semi-transparent. I notice in these specimens that some of them change in the dark to a dark olive colour" (R. M. L. *in litt.*).

Hab. Caledon, F. Purcell, 6986; Swellendam, F. Purcell, 6987; Kogman's Kloof, mountainside, near Ashton, F. Purcell, 6988.

Oopelta granulosa, Cllge.

A very fine example measuring in alcohol, 64 mm. long; mantle, 31·5 mm.

Hab. Hot Springs, Montague, F. Purcell, 6989.

Oopelta nigropunctata, Mörch,

Plate XIV., figs. 6, 11–12.

Judging from the specimens I have examined of this species, the form of the sperm-duct seems subject to much variation. I give a

* See also Check-list of the Slugs, 1893, p. 15.

further drawing of that in a specimen from Cape Town (plate XIV., figs. 11, 11*a*) and for comparison with *O. polypunctata* an internal view, and a figure of the alimentary canal (plate XIV., figs. 6, 12).

Oopelta polypunctata, n. sp.,

Plate XIV., figs. 3, 4, 7–10.

Animal greyish-yellow. Body marked by a series of oblique backwardly directed furrows 2–2·5 mm. apart. Mantle ovoid, slightly produced anteriorly and posteriorly, spotted with numerous (43–71) black dots, and has a decided greenish tinge. Dorsum flattish, no trace of a keel. Tail flattened and produced backward. Rugæ small. Peripodial groove distinct. Foot-fringe and foot-sole yellowish, no lineoles or division into median and lateral planes. Generative orifice a large crescentic-shaped opening. Length (in alcohol) 52 mm.; mantle 19 mm.

Hab. Caledon Div., Zonder End, R. F. Purcell, 6985.

After a careful study of a large series of specimens of *O. nigropunctata*, Mörch, I have been forced to recognise this as a distinct species. Externally it is very like light-coloured specimens of *O. nigropunctata*, only there are more black dots on the mantle. Internally, however, the form of the generative organs, particularly the sperm-duct, leaves little doubt as to its distinctness. There are also some minor differences in the form of the alimentary canal.

Alimentary Canal (plate XIV., fig. 5). The buccal cavity is short and is followed by a short œsophagus, and wide, thin-walled crop, which opens into the somewhat small, almost spherical sac, the stomach, on the left side of which the intestine passes off lying dorsal to the crop. Anteriorly a backward bend throws the intestine to the region of the stomach again; it then passes forward again as the rectum. Lying over the region of the œsophagus are the salivary glands, which are fused in the mid-dorsal line.

Compared with the intestinal tract in *O. nigropunctata* (plate XIV., fig. 6) it will be noticed that there are slight differences in the various regions, and particularly in the shape of the stomach.

Generative Organs.—These differ considerably from those in *O. nigropunctata*. The generative orifice is conspicuous as a wide, crescent-shaped opening leading into a small vestibule, from the right side of which a short, wide tube is given off which leads into the sperm-duct (plate XIV., fig. 7). Viewed externally it is seen to consist of two portions, which for purposes of description may be termed the anterior and posterior divisions; the latter appears as a wide sac,

with a short, finger-like process, while the former makes a bend ventrally and terminates in a sac-like extremity. To the side of this the large retractor muscle is inserted, and just above the point of insertion of the muscle the vas deferens is given off (plate XIV., figs. 8, 9). Internally (plate XIV., fig. 10) the posterior division contains a large, pointed, muscular organ attached to a broad, muscular base, quite unlike anything I have hitherto seen in any species of this genus. The anterior division is partially divided by a prominent muscular ridge (plate XIV., fig. 10, *m.r.*), beyond which the wall has a plicated appearance, due to a series of thick, muscular ridges with intervening thin portions. The retractor muscle is very long, measuring 9 mm. The vagina is a long, tubular cavity, considerably longer than in *O. nigropunctata ;* on the left side of this the receptaculum seminis opens, while beyond is a very short free-oviduct (plate XIV., fig. 7, *f.ov.*). Apart from the great length of the duct of the hermaphrodite gland, the remaining organs call for no special mention.

A dissection of the sperm-duct of *O. nigropunctata* (plate XIV., fig. 12) shows that there is nothing corresponding to the posterior division of *O. polypunctata.* There is a thick, muscular ridge, larger than in *O. polypunctata,* with a smaller one anterior to it (plate XIV., fig. 12).

A CHECK-LIST OF THE SLUGS OF SOUTH AFRICA.

LIMACIDÆ, Leach, 1820.

Limacinæ, W. G. Binn., 1864.

Limax, L., 1758.

1. *L. maximus*, L.: Syst. Nat., 12th ed., p. 108. *Hab.* Cape Town.
2. *L. variegatus*, Drp.: Tab. Moll., 1801, p. 103. *Hab.* Cape Colony, Natal.

Amalia, Moq.-Tand., 1855.

3. *A. gagates*, Drp.: Hist. Moll. France, 1801, p. 122, pl. ix., fig. 1. *Hab.* Cape Colony, Natal.
4. *A. capensis*, Krauss: Südafrik. Moll., 1848, p. 73. *Hab.* Cape Colony.
5. *A. ponsonbyi*, Cllge.: Ann. S. Afr. Mus., 1900, vol. ii., p. 2, pl. ii., figs. 1, 2. *Hab.* Cape Town.

Agriolimax, Mörch, 1868.

6. *A. agrestis*, L.: Syst. Nat., 12th ed., p. 652. *Hab.* Cape Town.
7. *A. lævis*, O. F. Müll.: Verm. Hist., 1774, vol. ii., p. 1. *Hab.* Cape Town.

UROCYCLIDÆ, Simr., 1895.

Urocyclus, Gray, 1864.

8. *U. kraussianus*, Heyn.: (Limax ? sp. Krauss, Südafrik. Moll., 1848, p. 73); Heyn.: Malak. Blatt., 1862, Bd. ix., p. 217; Jahrb. Deutsch. Malak. Gesell., 1885, p. 293. *Hab.* Cape Colony.
9. *U. kirkii*, Gray: Proc. Zool. Soc., 1864, p. 251. *Hab.* Natal.
10. *U. flavescens*, Kfst.: Malak. Blatt., 1866, p. 70, T. ii., figs. 1–8. *Hab.* Natal.
11. *U. pallescens*, Ckll.: Ann. Mag. N. H., 1891 (6 ser.), vol. viii., p. 101. *Hab.* Natal.
12. *U. fasciatus*, v. Marts.:

TESTACELLIDÆ, Gray, 1833.

Testacella, Cuv., 1800.

13. *T. aurigaster*, Layard.

Apera, Heyn.

14. *A. gibbonsi*, W. G. Binn.: Bull. Mus. Comp. Zoöl. Harvard, 1879, vol. v., p. 331; Heyn.: Jahrb. Deutsch. Malak. Gesell., 1885, Bd. xii., p. 17, T. ii., figs. 5–7. *Hab.* Natal.

15. *A. burnupi*, E. A. Sm.: Ann. Mag. N. H., 1892 (ser. 6), vol. x., p. 466; Cllge.: Ibid., 1897 (ser. 6) vol. xx., p. 221, pl. v.; Journ. of Malac., 1901, vol. viii., p. 71, fig. 1. *Hab.* Natal.
16. *A. natalensis*, Cllge.: Ann. S. Afr. Mus., 1900, vol. ii., p. 3, pl. i., figs. 3–4. *Hab.* Natal.
17. *A. purcelli*, Cllge.: Ante p. 230. *Hab.* Cape Town.

ARIONIDÆ, Gray, 1840.

OOPELTINÆ, Ckll., 1891.

OOPELTA, Mörch.

18. *O. aterrima*, Gray: Catal. Pulm., 1855, p. 55; Ckll.: Ann. Mag. N. H., 1890 (ser. 6), vol. vi., p. 387. *Hab.* South Africa.
19. *O. nigropunctata*, Mörch: Heyn.: Malak. Blatt., 1867, Bd. xiv., p. 191, T. 2, figs. 1–2; Cllge.: Ann. S. Afr. Mus., 1900, vol. ii., p. 5, pl. i., figs. 7–8, pl. ii., fig. 16. *Hab.* Cape Colony.
20. *O. flavescens*, Cllge.: Ann. S. Afr. Mus., 1900, vol. ii., p. 6, pl. i., figs. 9–10. *Hab.* Cape Colony.
21. *O. granulosa*, Cllge.: Ann. S. Afr. Mus., 1900, vol. ii., p. 6, pl. i., figs. 11–12. *Hab.* Cape Colony.
22. *O. polypunctata*, Cllge. Ante p. 232.

ARIONINÆ, W. G. Binn., 1864.

ARION, Fér., 1819.

23. *A. fuscus*, O. F. Müll.: Verm. Hist., 1774, vol. ii., p. 11. *Hab.* Cape Town.

VERONICELLIDÆ, Gray, 1840.

VERONICELLA, Blainv.,

24. *V. maura*, Heyn.: Jahrb. Deutsch. Malak. Gesell., 1885, Bd. xii., p. 6, T. i., figs. 6–7. *Hab.* Delagoa Bay.
25. *V. natalensis*, Rapp.: Krauss: Südafrik. Moll., 1848, p. 73. *Hab.* Natal.
26. *U. petersi*, v. Marts.: Monatsber. Preuss. Akad. Wissensch., 1880, p. 736. *Hab.* Inhambane.
27. *U. saxicola*, Ckll.: Conchologist, 1893, vol. ii., p. 216. *Hab.* Port Elizabeth.

ONCHIDIIDÆ, Gray, 1824.

ONCHIDIUM, Buchan., (Em. Plate, 1893).

28. *O. peroni*, Cuv.: Ann. Mus. Nat. Hist., 1804, vol. v., p. 38, pl. vi. *Hab.* Cape Colony.

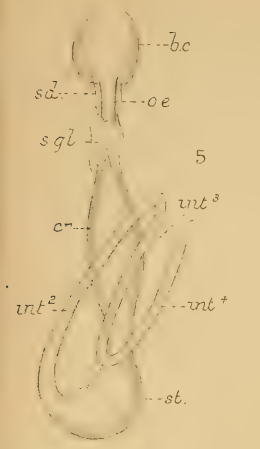
EXPLANATION OF PLATE XIV.

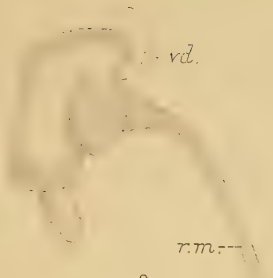
FIG.

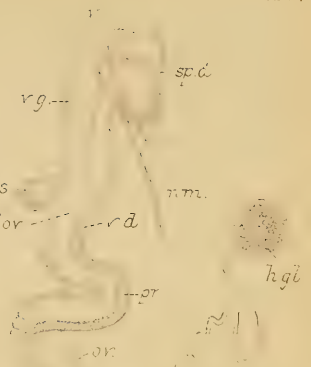
1. *Apera purcelli*, n. sp., view from the right side. X2.
2. ,, ,, ,, dorsal view. X2.
3. *Oopelta polypunctata*, n. sp., view from the right side. X1.
4. ,, ,, ,, dorsal view. X1.
5. ,, ,, ,, alimentary canal.
6. *Oopelta nigropunctata*, Mörch, alimentary canal.
7. *Oopelta polypunctata*, n. sp., generative organs.
8. ,, ,, ,, dorsal view of sperm-duct, enlarged.
9. ,, ,, ,, ventral view of same, enlarged.
10. ,, ,, ,, sperm-duct dissected to show internal structure. X4.
11–11*a*. *Oopelta nigropunctata*, Mörch, sperm-duct.
12. ,, ,, ,, sperm-duct dissected to show internal structure. X3.

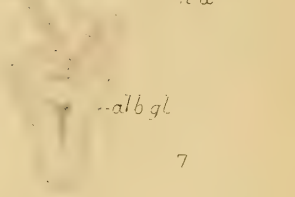
REFERENCE LETTERS.

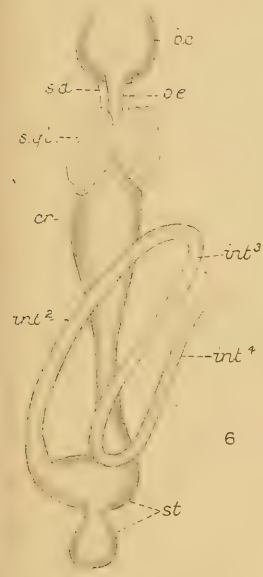
alb. gl. Albumen gland.
b. c. Buccal cavity.
cr. Crop.
f. ov. Free-oviduct.
h. d. Hermaphrodite duct.
h. gl. Hermaphrodite gland.
œ. Œsophagus.
int. Intestine.
m. r. Muscular ridge.
ov. Oviduct.
pr. Prostate.
r. m. Retractor muscle.
s. d. Salivary duct.
s. gl. Salivary gland.
st. Stomach.
v. Vestibule.
vg. Vagina.

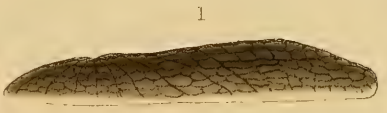


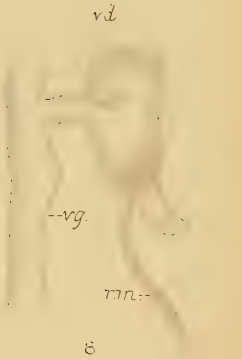


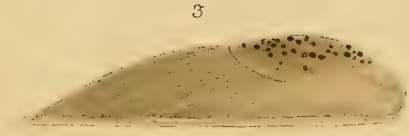


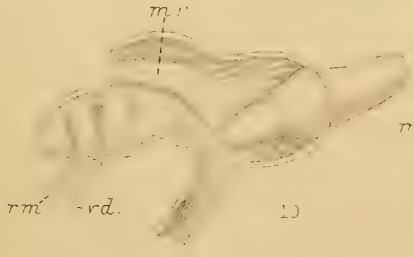












Figs 1-4, 10, 12 F.D.P. del. ad nat.
Figs 5-9, 11 W.E.C. del. ad nat.

West, Newman. chromo

South African Slugs.

XII.—*Rhynchotal Miscellanea.*—By W. L. Distant.

Plate XV.

Part I.—AFRICAN *TINGIDIDÆ*.

In recently studying the African *Tingididæ*, I was under the greatest obligation to Dr. Yngve Sjöstedt, of the Stockholm Museum, for lending me typical specimens of Stål's African species. Nearly all of these are here figured, and with one exception, so far as I am aware, they, with the new species and genus here described, constitute the first illustrations of Ethiopian *Tingididæ*. However carefully these small insects may be described, it is almost impossible to recognise them specifically—if not generically—without the aid of a good figure. I have also enumerated all the species known to me which have been described from Africa. I have not included Madagascar, nor the other African islands.

It is greatly to be desired that entomologists in all parts of Africa would pay some attention to these interesting insects. Lethierry and Séverin in their Catalogue published in 1896 enumerated 335 species for the whole world. Since then Mr. Champion, who collected in Central America, has for that region alone enumerated seventy-eight species, of which sixty-six were previously undescribed, and required the proposal of seven new genera. This will give some idea of what may be done in Africa, where at present I can now only refer to twenty-six species distributed in twelve genera.

Family TINGIDIDÆ.

Sub-Family PIESMINÆ.

Piesma diluta (Pl. XV., fig. 1).

Zosmerus dilutus, Stål, Öfv. Vet.-Ak. Förh., 1855, p. 37. 1.; Hem. Afr. iii. p. 26. 1 (1865).

Piesma diluta, Stål, En. Hem. iii. p. 115 (1873).

Hab. "Caffraria" (Stockholm Mus.).

Sub-Family TINGIDINÆ.

Cantacader tenuipes (Pl. XV., fig. 2).

Cantacader tenuipes, Stål, Hem. Afr. iii. p. 26 (1865); En. Hem. iii. p. 116 (1873).

Hab. Sierra Leone (Stockholm Mus.).

Cantacader afzelii (Pl. XV., fig. 3).

Cantacader Afzelii, Stål, En. Hem. iii. p. 116 (1873).

Hab. Sierra Leone (Stockholm Mus.).

Cantacader attenuatus, sp. n.

Pale brownish ochraceous; apical joint of the antennæ and apices of the tarsi fuscous; eyes, and a small lateral marginal spot at about middle of hemelytra, black; head very obsoletely punctate; pronotum coarsely punctate, strongly tricarinate, the lateral margins carinately elevated, the arcuate transverse carina also equally well developed; hemelytra thickly reticulate, discoidal area about as wide as the subcostal area, well defined by marginal carination.

Long. 4 mm.; max. lat. abdom. 2 mm.

Hab. Cape Colony (Coll. Dist.).

Phatnoma æthiops, sp. n. (Pl. XV., fig. 12).

Pale brownish ochraceous; head, central disk of pronotum and some small lateral marginal spots, a spot at base of scutellum, a very irregular transverse fascia to hemelytra crossing the discoidal area before centre, and some minute subapical spots to same, some transverse spots to costal area, and small spots to sutural area, dark fuscous; femora fuscous above; antennæ mutilated in type. Pronotum moderately ampliated and reflexed, rounded posteriorly, the anterior angles minutely spinous, the disk punctate and tricarinate; hemelytra broad, ovate, their lateral margins regularly convex, discoidal area much wider than subcostal, separated by a sharply raised carina.

Long. 3 mm.; max. lat., about 1½ mm.

Hab. Cape Colony (S. Afr. Mus. and Coll. Dist.).

Phatnoma testacea, sp. n (Pl. XV., fig 13).

Very pale ochraceous; head, different carinæ, and the femora brownish ochraceous; pronotum with the lateral margins less dilated and much more oblique than in *P. æthiops*, the disk punctate

and tricarinate: hemelytra with the discoidal area narrower and the costal area broader than in that species, discoidal area crossed by two very distinct transverse carinæ.

Long. 2½–3 mm.; max. lat. 1½–1¾ mm.

Hab. Cape Colony (S. Afr. Mus. and Coll. Dist.).

PHATNOMA HUMERALIS, sp. n. (Pl. XV., fig. 14.).

Ochraceous with a strong purplish tinge; head and central disk of pronotum fuscous; costal and subcostal membranes, subhyaline, with fuscous cellular markings; pronotum with the lateral areas and angles pale ochraceous, the last strongly and angularly produced, their apices terminating in three acute spines, disk punctate and tricarinate; hemelytra broadly rounded, the discoidal area being much broader than the subcostal, and irregularly transversely and longitudinally carinate.

Long. 3½ mm.; max. lat. 2½ mm.

Hab. Cape Colony (S. Afr. Mus. and Coll. Dist.).

PHATNOMA OBESA, sp. n. (Pl. XV., fig. 16).

Pale brownish-ochraceous, lateral discal areas of pronotum, and subcostal areas of hemelytra pale hyaline minutely speckled with pale fuscous; a distinct transverse black fascia on anterior area of pronotum, the lateral margins of which are very strongly recurved upward, convexly rounded, their edges broadly recurved, disk strongly punctate and tricarinate, anterior margin truncate, lateral margins of the hemelytra upwardly recurved, moderately convex, discoidal area about as broad as the costal and subcostal areas together, irregularly transversely and longitudinally carinate.

Long. 3 mm.; max. lat. 1½ mm.

Hab. Cape Colony (Coll. Dist.).

CNEMIANDRUS, gen. nov.

Rostrum reaching or slightly passing the posterior coxæ; rostral groove parallel and reaching the posterior coxæ; antennæ short, moderately slender, fourth joint a little longest and incrassated; head subtriangular, convex above, apex with two very obscure short obtuse spines, and a short spinous tubercle on each lateral margin near apex; pronotum with the posterior disk and the anterior marginal area gibbous, between which the surface is distinctly foveate, the base truncate, the lateral margins concavely sinuate, the

lateral angles broadly rounded, the disk distinctly tricarinate, with a fainter and much more obscure carination on each lateral area; hemelytra opaque, closely and finely reticulate, with a well-defined clavus, and sutural, discoidal, subcostal and costal areas, the discoidal area well defined by a raised carina, the discoidal and subcostal areas with a few raised transverse lines, much more distinct on the subcostal area; legs somewhat short, femora slightly thickened.

Cnemiandrus typicus, sp. n. (Pl. XV., fig. 18).

Dull pale ochraceous, opaque, the sutural area paler; apical joint of antennæ and the tarsi subpiceous; head and pronotum coarsely punctate, antennæ with the second and third joints subequal in length, fourth slightly longest, thickened and fusiform; other structural characters as detailed in generic diagnosis.

Long. 2½–3 mm.

Hab. Cape Colony (S. Afr. Mus. and Coll. Dist.).

Ceratinoderma fornicata (Pl. XV., fig. 4).

Ceratinoderma fornicata, Stål, En. Hem. iii. p. 117 (1873).

Hab. Caffraria (Stockholm Mus.).

Genus LEPTOSTYLA.

Leptostyla, Stål, En. Hem. iii. pp. 120, 125 (1873); Champ. Biol. Centr. Amer. Rhynch. ii. p. 11. (1897).

Although this somewhat extensive genus has hitherto been considered an exclusively American one, I have little hesitation in including this African species, taking Mr. Champion's amplified generic characters (*supra*), especially as regards the size of the pronotal hood, which in the species described below exhibits the maximum of development.

Leptostyla natalicola, sp. n. (Pl. XV., fig. 15).

Moderately elongate, broad, pale hyaline; head, disk, posterior area and lateral margins of pronotum, sutural area and an oblique subapical fascia to the hemelytra umber-brown; antennæ ochraceous, slightly fuscous at apices; venation of the hemelytra pale brownish, sutural area with an elongate excavate blackish spot. Head with three long and acutely pointed spines—one median and two lateral; antennæ with the first joint about twice as long as second; pronotal

margins very broadly produced upwardly and forwardly, their apices convexly rounded; hemelytra gradually widening from the base where their margins are obliquely convex, their apices broad and angularly rounded.

Long. 4½ mm.; max. lat. 2½ mm.

Hab. Pt. Natal (Gueinzius—Brit. Mus.).

Copium glabricorne.

Copium glabricorne, Montand. Revue d'Entom. xi. p. 267 (1892).

Hab. Mozambique.

Phyllontochila alaticollis (Pl. XV., fig. 5).

Phyllontocheila alaticollis, Stål, Öfv. Vet.-Ak. Förh., 1885, p. 37, 2.

Monanthia (*Phyllontochila*) *alaticollis*, Stål, Hem. Afr. iii. p. 27 (1865).

Phyllontochila alaticollis, Stål, En. Hem. iii. p. 128 (1873).

Hab. Caffraria (Stockholm Mus.).

Phyllontochila wahlbergi.

Phyllontocheila wahlbergi, Stål, Öfv. Vet.-Ak. Förh., 1855, p. 37, 1.

Monanthia (*Phyllontochila*) *wahlbergi*, Stål, Hem. Afr. iii. p. 27 (1865).

Phyllontochila wahlbergii, Stål, En. Hem. iii. p. 128 (1873).

Hab. Caffraria (Stockholm Mus.).

Phyllontochila dilatata.

Tingis dilatata, Guér, Mag. Zool., 1831.

Hab. West Africa; Rhodesia.

Phyllontochila Mayri.

Phyllontochila mayri, Hagl., Öfv. Vet.-Ak. Förh., 1895, p. 471.

Hab. W. Africa; Cameroons.

Phyllontochila cafer, sp. n. (Pl. XV., fig. 17).

Somewhat greyishly fuscous, lateral margins of pronotum and hemelytra pale hyaline, more or less spotted and marked with fuscous; antennæ pale ochraceous, moderately pilose, first and second joints brownish, apical joint dark fuscous; pronotum with the disk dark fuscous, the tricarination and the hood pale ochraceous, the lateral margins laminately dilated and convex, broadest

anteriorly; hemelytra closely reticulate, discoidal area much broader than the subcostal area; body beneath fuscous; legs ochraceous.

Long. 3 mm.; max. lat. 2 mm.

Hab. Cape Colony (S. Afr. Mus. and Coll. Dist.).

LASIACANTHA ODONTOSOMA (Pl. XV., fig. 6).

Tingis (*Lasiacantha*) *odontosoma*, Stål, En. Hem. iii. p. 130 (1873).

Hab. Sierra Leone (Stockholm Mus.).

ELASMOGNATHUS FIEBERI (Pl. XV., fig. 7).

Elasmognathus fieberi, Stål, Öfv. Vet.-Ak. Förh., 1855, p. 38, 1; En. Hem. iii. p. 129 (1873).

Monanthia (*Elasmognathus*) *fieberi*, Stål, Hem. Afr. iii. p. 29, 7 (1865).

Hab. Caffraria (Stockholm Mus.).

CYSTEOCHILA CAFFRA (Pl. XV., fig. 8).

Cysteochila caffra, Stål, En. Hem. iii. p. 129 (1873).

Hab. Caffraria (Stockholm Mus.).

CYSTEOCHILA SORDIDA.

Monanthia (*Physatocheila*) *sordida*, Stål, Freg. Eug. resa, Ins. Hem. p. 259, 109 (1859).

Monanthia (*Physatochila*) *sordida*, Stål, Hem. Afr. iii. p. 29, 6 (1865).

Cysteochila sordida, Stål, En. Hem. iii. p. 129 (1873).

Hab. Cape Good Hope (Stockholm Mus.).

MONANTHIA ORNATELLA (Pl. XV., fig. 9).

Tropidocheila ornatella, Stål, Öfv. Vet.-Ak. Förh., 1855, p. 37, 1.

Monanthia (*Physatochila*) *ornatella*, Stål, Hem. Afr. iii. p. 28, 3 (1865).

Monanthia (*Compseuta*) *ornatella*, Stål, En. Hem. iii. p. 133 (1873).

Hab. Caffraria (Stockholm Mus.).

MONANTHIA NATALENSIS (Pl. XV., fig. 10).

Physatocheila natalensis, Stål, Ofv. Vet.-Ak. Förh., 1855, p. 38, 1.

Monanthia (*Physatochila*) *natalensis*, Stål, Hem. Afr. iii. p. 28, 4 (1865).

Monanthia (*Compseuta*) *natalensis*, Stål, En. Hem. iii. p. 133 (1873).
Hab. Caffraria (Stockholm Mus.).

MONANTHIA FEMORALIS.

Monanthia (*Compseuta*) *femoralis*, Stål, En. Hem. iii. p. 133 (1873).
Hab. Caffraria (Stockholm Mus.).

MONANTHIA CAPENSIS.

Piesma capensis, Walk. Cat. Het. vii. p. 6, 12 (1873).

MONANTHIA PICTURATA, sp. n. (Pl. XV., fig. 11).

Greyish; mottled with fuscous; antennæ and legs ochraceous, apical joints of the antennæ and the tarsi black; hemelytra with a black basal line and a lineate black subapical spot at outer margin of discoidal area, the inner margin of this area also defined by the same colour; costal area pellucid marked with transverse black lines; margins of the sutural area narrowly black. Antennæ a little shorter than the body; first and second joints subequal in length; pronotum posteriorly dilated; hemelytra distinctly ampliated from base to beyond middle, and then moderately narrowed to apex which is rounded.

Long. $3\frac{1}{2}$ mm.

Hab. Cape Colony; Stellenbosch. (Peringuey—Coll. S. Afr. Mus.)

Part II.—RHYNCHOTA FROM THE TRANSVAAL, MASHONALAND, AND BRITISH NYASALAND.

In the 'Annals and Magazine of Natural History' (Ser. 7, vol. ii. pp. 294–315 (1898), I gave an enumeration of the species belonging to the Family Pentatomidæ, which I had collected and acquired in the Transvaal; of those collected by Mr. Guy A. K. Marshall, near Salisbury, Mashonaland; and others received from Dr. Percy Rendall in Nyasaland. I now continue the enumeration of similar material belonging to the Family Coreidæ.

HETEROPTERA FROM THE TRANSVAAL.

Family COREIDÆ.

Sub-Family COREINÆ.

Division MICTARIA.

Holopterna alata, Westw. Pretoria (W. L. D.); Barberton (Rendall); Lydenburg Distr. (Pret. Mus.).

Anoplocnemis curvipes, Fabr. Pretoria (W. L. D.); Barberton (Rendall); Lydenburg Distr. (Pret. Mus.).

" *montandoni*, Dist. Lydenburg Distr. (Pret. Mus.).

" *annulicornis*, Germ. Waterberg District, Warm Baths (W. L. D.); Pretoria (W. L. D.).

" *caffra*, Stål. Lydenburg Distr. (Coll. Dist. and Pret. Mus.).

" *apicalis*, Germ. Pretoria (W. L. D.); Barberton (Rendall).

" *dallasianus*, Leth. and Sev. Krugersdorp. (Brit. Mus.).

" *pagana*, Dall. Krugersdorp (Coll. Dist.).

Division PETASCELARIA.

Petillia mormo, Stål. Barberton.

Petascelis remipes, Sign. Pretoria (W. L. D.); Barberton (Rendall).

Carlisis wahlbergi, Stål. Lydenburg Distr.

Division DALADERARIA.

Elasmogaster africanus, Dall. Lydenburg Distr. (Pret. Mus.).

Division HOMOEOCERARIA.

Homoeocerus magnicornis, Burm. Pretoria (W. L. D.); Barberton (Rendall); Lydenburg Distr. (Pret. Mus.)
,, *auriculatus*, Stål. Pretoria (W. L. D.); Lydenburg Distr. (Pret. Mus.).
,, *annulatus*, Thunb. Pretoria (W. L. D.); Barberton (Rendall); Lydenburg Distr. (Pret. Mus.).
,, *nigricornis*, Germ. Transvaal (no exact local.—Coll. Dist.).
,, *plagiatus*, Germ. Barberton (Rendall); Pretoria (W. L. D.); Johannesburg (A. Ross); Lydenburg Distr. (Pret. Mus.).
,, *wealei*, Dist. Barberton (Rendall).
,, *perpolitus*, sp. n. Barberton (Rendall).
,, *scutellatus*, sp. n. Lydenburg Distr. (Coll. Dist. and Pret. Mus.).
,, *discolor*, Stål. Lydenburg Distr. (Coll. Dist. and Pret. Mus.).

Division LATIMBARIA.

Latimbus punctatus, Dall. Pretoria (W. L. D.).

Division ANISOSCELARIA.

Leptoglossus membranaceus, Fabr. Lydenburg Distr. (Pret. Mus.).

Division PHYSOMERARIA.

Rhyticoris terminalis, Burm. Lydenburg Distr. (Pret. Mus.).
Acanthocoris fasciculatus, Fabr. Barberton (Rendall).
,, *lugens*, Stål. Pretoria (W. L. D.).
,, *scrofa*, Germ. Pretoria (Pret. Mus.); Zoutpansberg (Kaesner).
Petalocnemis apicalis, Dall. Pretoria (Pret. Mus.).
Choerommatus indutus, Stål. Lydenburg Distr. (Pret. Mus. and Coll. Dist.).

Division PENDULINARIA.

Pendulinus hasticornis, Thunb. Lydenburg Distr. (Pret. Mus.).
,, *fimbriatus*, sp. n. Lydenburg Distr. (Pret. Mus. and Coll. Dist.).

Division GONOCERARIA.

Plinacthus pungens, Thunb. Pretoria (W. L. D.).
,, *falcatus*, Dist. Pretoria (W. L. D.).
Cletus varius, Dall. Pretoria (W. L. D.).
,, *pusillus*, Dall. Pretoria (W. L. D.).
,, *ochraceus*, H. S. Pretoria (W. L. D.); Barberton (Rendall); Zoutpansberg (Kaesner).

Sub-Family PSEUDOPHLOEINÆ.

Acanthomia natalensis, Stål. Klerksdorp (Coll. Dist.); Lydenburg Distr. (Coll. Dist. and Pret. Mus.).
Brotheus viridis, gen. and sp. n. Pretoria (W. L. D.).

Sub-Family ALYDINÆ.

Division STENOCEPHALARIA.

Stenocephalus testaceus, Stål. Pretoria (Coll. Dist. and Pret. Mus.).

Division ALYDARIA.

Euthetus leucopœcilus, Stål. Barberton (Rendall).

Homoeocerus perpolitus, sp. n.

Head, antennæ, pronotum, rostrum, body beneath and legs pale ochraceous; basal margin of pronotum, scutellum, and corium, purplish brown; anterior lateral margins of the corium, and the connexivum pale ochraceous; anterior lateral margins of the pronotum black; lateral margins of the head blackly punctate; eyes castaneous; membrane bronzy. Antennæ incrassate, basal joint thickest and a little shorter than second, and about equal in length to third joint, fourth joint shortest and attenuated at each end; pronotum with an indistinct fascia of dark punctures at anterior margin, and with the basal dark margin thickly and dis-

tinctly punctate; scutellum and corium thickly and distinctly punctate, the lateral margins of the corium levigate; rostrum extending to between the anterior and intermediate coxæ, its apex black. Lateral pronotal angles prominent, apices broadly subacute.

Long. 15 mm.; exp. pronot. angl. 5 mm.

Hab. Transvaal; Barberton (Rendall).

Homoeocerus scutellatus, sp. n.

Body above and beneath and legs, ochraceous; antennæ, base of pronotum, corium—excluding lateral and apical margins, the last broad—and the tarsi purplish brown; fourth joint of antennæ, apex of third joint, and anterior lateral margins of pronotum piceous; scutellum very pale ochraceous; membrane bronzy; abdomen beneath with an obscure lateral fascia on each side, furrowed on the fourth, fifth, and sixth segments, and outwardly margined by two small black spots on the second and third segments. Antennæ incrassated, basal joint thickest and shorter than either second or third joints, second longer than third, fourth shortest; head, pronotum, and corium thickly and finely punctate; scutellum transversely wrinkled and punctate; lateral and apical margins of the corium impunctate; rostrum almost reaching the intermediate coxæ. Lateral pronotal angles prominent, broadly subacute, and distinctly upwardly reflexed.

Long. 17 mm.; exp. pronot. angl. 6 mm.

Hab. Transvaal; Lydenburg Dist. (Pret. Mus. and Coll. Dist.).

Pendulinus fimbriatus, sp. n.

Above dark brownish ochraceous; corium with about two-thirds of the lateral margin from base and lateral margins of pronotum—very narrowly—dark olivaceous green; membrane bronzy black; connexivum castaneous; antennæ castaneous, the apical joint brownish ochraceous; body beneath and rostrum very pale ochraceous; rostrum with a central piceous line; legs brownish ochraceous. Antennæ with the first, second, and third joints almost subequal in length, third slightly longest, fourth shortest and palest at base; pronotum and scutellum thickly and distinctly punctate, corium and head more finely punctate; rostrum passing the intermediate coxæ; sternum very distinctly, and abdomen very obscurely punctate; lateral angles of the pronotum rounded, subprominent.

Long. 20 mm.; exp. pronot. angl. 6 mm.

Hab. Transvaal; Lydenburg Distr. (Pret. Mus. and Coll. Dist.).

Brotheus, gen. nov.

Body moderately elongate; head robust, broad, a little swollen between the eyes, ocelli placed a little behind eyes and about as far apart from them as from each other; a distinct, slender, somewhat outwardly directed spine on each side before base of antennæ; antennæ robust, basal joint stoutly incrassate throughout, prominently and coarsely hirsute on both sides, about as long as the head, remaining joints more slender, second slightly longer than the third, fourth short and cylindrical; eyes less remote from base than from apex, nonprominent and somewhat adpressed; pronotum with the anterior area deflected, the later margins concavely sinuate, the lateral angles prominent or prominently spinous; scutellum moderately small and triangular, corium a little longer than the membrane which has mostly longitudinal veins; rostrum inserted below the apex of the head and just passing the intermediate coxæ; third joint longest; mesosternum with a central sulcation; legs normal, femora moderately thickened.

Brotheus viridis, sp. n.

Pale greenish; head, anterior area of pronotum, and suffusions to body beneath, sometimes the whole of mesonotum—and legs, greenish ochraceous; apical joint of the antennæ and lateral angles of the pronotum, pale sanguineous; corium with a pale spot on the apical margin; membrane pale hyaline. Above thickly punctate; pronotum with a subobsolete central levigate line, lateral angles variable, generally moderately prominent and obtusely angulated, slightly directed upwardly—in one specimen the apices are distinctly acutely spinous; body beneath thickly but more obscurely punctate than above.

Long. 9–10 mm.

Hab. Transvaal: Pretoria (W. L. D.).

HETEROPTERA FROM MASHONALAND.

Family COREIDÆ.

Sub-Family COREINÆ.

Division MICTARIA.

Anoplocnemis curvipes, Fabr. Salisbury.
„ *montandoni*, Dist. Salisbury.

Anoplocnemis tomento-virgata, Stål. Salisbury.
,, *apicalis*, Germ. Salisbury.

Division PETASCELARIA.

Petascelis remipes, Sign. Salisbury.
Carlisis wahlbergi, Stål. Salisbury.

Division HOMOEOCERARIA.

Homoeocerus auriculatus, Stål. Umfuli River.
,, *bicolor*, Germ. Salisbury.

Division PHYSOMERARIA.

Acanthocoris fasciculatus, Fabr. Salisbury.

Division GONOCERARIA.

Cletus, varius, Dall. Salisbury.
,, *decoratus*, sp. n. Salisbury.

Sub-Family ALYDINÆ.

Euthetus limbatus, sp. n. Umfuli River.
,, *stigmosus*, sp. n. Salisbury.

Cletus decoratus, sp. n.

Brownish ochraceous, thickly and darkly punctate; a central line continued through head and pronotum to a central slightly curved fascia between the lateral angles, lateral margins of head and pronotum, posterior pronotal lateral margins, lateral margins, apex, and a central fascia to scutellum, lateral margins—excluding apex, apical margins, and veins to corium, ochraceous; membrane pale fuliginous; body beneath and legs brownish ochraceous, disk of abdomen and the femora minutely spotted with black; two obscure dark fasciæ traversing the lateral areas of sternum and abdomen; antennæ brownish ochraceous, second joint longest, third and fourth joints almost subequal in length.

Long. 10–12 mm.; exp. pronot. angl. $4\frac{1}{2}$–5 mm.

Hab. Mashonaland: Salisbury (G. A. K. Marshall).

Euthetus limbatus, sp. n.

Black; lateral margins of corium broadly ochraceous; body beneath black; a spot on lateral margins of head behind eyes, a spot near intermediate coxæ, some spots at base of lateral margins of abdomen and a large oblique spot on third abdominal segment reddish ochraceous; anterior margin of prosternum, coxæ, and posterior angles and margin of metasternum, ochraceous; legs brownish ochraceous, apices of femora black preceded by a reddish-ochraceous annulation; antennæ ochraceous, apices of the first and second joints, and the whole of the third and fourth joints—excluding bases—piceous. Body above distinctly punctate, the lateral margins of the corium obscurely punctate; second joint of antennæ short, apical joint longest.

Long. 10 mm.

Hab. Mashonaland: Umfuli River (G. A. K. Marshall).

Euthetus stigmosus, sp. n.

Head, anterior margin of pronotum, rostrum, body beneath, and legs, black; pronotum brownish ochraceous, its posterior-lateral and posterior margins luteous, and with a dark central longitudinal fascia; scutellum black, its apex luteous; corium ochraceous with a distinct cell near inner angle; membrane pale bronzy; a broad fascia commencing at apex of head and continued through lateral areas of head and sternum, posterior angles and posterior margin of metasternum, angulated lateral margins of abdomen—not extending to apex—an oblique spot to third abdominal segment, and the posterior coxæ luteous; antennæ piceous, the bases of second and fourth joints pale brownish; femora with a pale narrow subapical annulation.

Long. 11 mm.

Hab. Mashonaland: Salisbury (G. A. K. Marshall).

HETEROPTERA FROM BRITISH NYASALAND.

Family COREIDÆ.

Sub-Family COREINÆ.

Division MICTARIA.

Phyllogonia limosa, Walk. Fort Johnston.

Cossutia flaveola, Dru. Zomba.

Cossutia stâli, Sign. Zomba.
Anoplocnemis curvipes, Fabr. Fort Johnston and Zomba.

Division PETASCELARIA.

Petascelis remipes, Sign. Zomba.

Division DALADERARIA.

Dalader africanus, Dall. Fort Johnston.

Division PHYSOMERARIA.

Acanthocoris granosus, Stâl. Fort Johnston and Zomba.

Division GONOCERARIA.

Cletus capensis, Westw. Fort Johnston.
,, *ochraceous*, H. S. Fort Johnston.

Part III.—DESCRIPTIONS OF SOME NEW SPECIES FROM VARIOUS LOCALITIES.

Family PENTATOMIDÆ.

Severiniella cameroni, sp. n.

Luteous, irregularly darkly punctate, the punctures black on head and pronotum, castaneous on scutellum; lateral marginal areas of the pronotum luteous, sparingly punctate; scutellum very indistinctly rugulose, the surface interspersed with levigate, luteous rugulosities; sternum piceous, opaque, lateral areas of prosternum, lateral margins of meso- and metasterna, coxæ, and legs, luteous; apices of femora and bases of tibiæ narrowly piceous; abdomen brownish ochraceous, the lateral areas a little paler beyond the stigmata; ocelli black.

♂. Head from base to apex of anterior process very slightly longer than scutellum, the prolonged cephalic process biangulate at apex, the angles subacute, their margins almost obliquely straight.

♀. Head broad, shorter than pronotum, prominently cleft between the apices of the central lobes, obliquely straight for about half the length from eyes, and then obliquely truncate to apex.

Long. ♂ 18, ♀ 11½ mm.; max. lat., ♂ 10, ♀ 9 mm.

Hab. British Nyasaland; Zomba (K. I. Cameron).

Allied to the West African *S. haasi*, Montand., from which it differs by the shorter cephalic process in the ♂, with its apex not concave, but angulate; lateral margins of pronotum less angulately produced, &c.

Diploxys waterbergensis, sp. n.

Head ochraceous, central area brownish and punctate, lateral margins impunctate, extreme edge fuscous; antennæ reddish ochraceous, fourth and fifth joints black, base of fourth joint reddish ochraceous; pronotum ochraceous, very coarsely punctate, anterior marginal area more finely punctate, lateral angles acutely and laterally produced somewhat reddish, their apices black; scutellum ochraceous, basal area and central margins coarsely blackly punctate,

an elongate ochraceous levigate spot in each basal angle, a very small black spot at apex; corium ochraceous blackly punctate, basal lateral margins levigate ochraceous; connexivum ochraceous, apical angles black; membrane fuliginous; body beneath and legs ochraceous, body darkly punctate, a fasciate series of dark punctures on each lateral area of the abdomen, stigmata black.

Long. 10 mm.; exp. pronot. angl. 6 mm.

Hab. Transvaal; Waterberg Distr. (Pret. Mus. and Coll. Dist.).

Allied to *D. thoracica*, Dist., but differing by the straight, not forwardly directed pronotal angles, the impunctate apical area of the scutellum, &c.

Family COREIDÆ.

Homoeocerus delagoæ, sp. n.

Ochraceous; antennæ brownish ochraceous; base of pronotum, the scutellum and corium obscurely greenish; membrane bronzy; tarsi brown; antennæ moderately thickened, first joint stoutest and almost as long as the second, third a little longer than the fourth; head and pronotum obscurely punctate, the last with its basal area more distinctly punctate, the lateral angles prominently and somewhat acutely produced; scutellum punctate with a distinct fovea near each basal angle; corium thickly punctate, its lateral margin impunctate and a little paler in hue; sternum very coarsely punctate, abdomen finely punctate; stigmata piceous; rostrum not reaching the intermediate coxæ.

Long. ♀ 20 mm.; exp. pronot. angl. 7 mm.

Hab. Delagoa Bay (Junod).

Euthetus pallescens, sp. n.

Body above pale brownish ochraceous; pronotum with a distinct central darker longitudinal line; apex of scutellum ochraceous; corium with a distinct cell near inner angle; body beneath black; lateral margins of head beneath reddish ochraceous; posterior angles of prosternum brownish; intermediate and posterior coxæ, posterior margins of metasternum, lateral abdominal spots, and an oblique spot on third abdominal segment, luteous; antennæ piceous, bases of second, third, and fourth joints ochraceous; legs brownish; femora with a pale subapical annulation.

Long. 10 mm.

Hab. Mozambique: Rikatla (Junod).

Family REDUVIIDÆ.

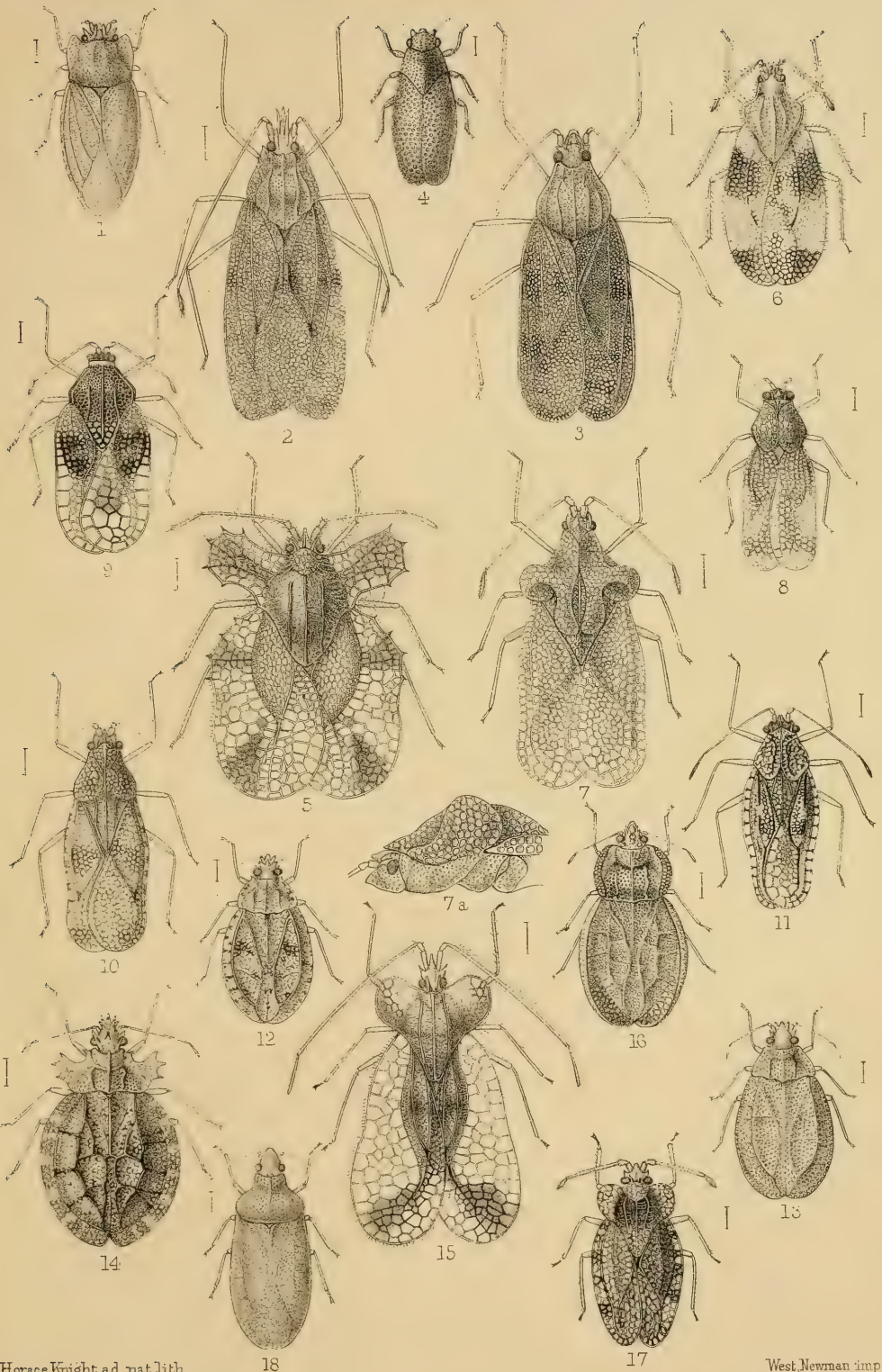
Callilestes bicolor, sp. n.

Black; base of head, pronotum, scutellum, basal and apical angles of corium, body beneath and legs sanguineous; tarsi, and apices of intermediate and posterior tibiæ, black; membrane with the margins pale fuliginous.

Var. Central sulcation to pronotum, black. Femora strongly nodulose; corium thickly, finely, but obsoletely punctate; scutellum carinately elevated, distinctly foveate near base.

Long. incl. membr. 14 mm.

Hab. Transvaal; Pienaars River (W. L. D.); Mashonaland; Umfuli River (G. A. K. Marshall).



Horace Knight ad. nat. lith. West, Newman imp.

African Tingididæ.

XII.—*The Moths of South Africa* (Part II.).—By Sir G. F. Hampson, Bart., B.A., F.Z.S., &c.

The first part of the classification of the Moths of South Africa appeared in the Annals of the South African Museum, Vol. II., pp. 33–66, and contained a classification of the familiar *Syntomidæ*, *Arctiadæ*, and *Agaristidæ*, whilst the present part deals with the whole of the large family *Noctuidæ*.

An (*) indicates that the species is not in the British Museum.

NOCTUIDÆ.

Key to the Sub-Families.

A. Maxillary palpi absent.
  a. Hindwing with vein 5 obsolescent from middle of discocellulars.
    a^1. Mid and hind tibiæ spined .. .. *Agrotinæ*.
    b^1. Mid and hind tibiæ not spined.
      a^2. Eyes hairy .. .. *Mamestrinæ*.
      b^2. Eyes not hairy.
        a^3. Eyes with long overhanging cilia .. .. .. *Polianæ*
        b^3. Eyes not ciliated .. .. *Caradrininæ*.
  b. Hindwing with vein 5 well developed.
    a^1. Hindwing with vein 5 more or less approximated to 4 at base.
      a^2. Frenulum of female simple.
        a^3. Abdomen with lateral anal pencils of hair .. .. *Eutelianæ*.
        b^3. Abdomen without anal pencils of hair; forewing with tufts of raised scales in cell .. .. *Stictopterinæ*.
      b^2. Frenulum of female multiple.
        a^3. Retinaculum of male bar-shaped.
          a^4. Forewing with tufts of raised scales in cell *Sarrothripinæ*.
          b^4. Forewing without tufts of raised scales in cell .. .. *Acontianæ*.
        b^3. Retinaculum of male not bar-shaped.
          a^4. Mid tibiæ spined .. .. *Homopterinæ*.

b^4. Mid tibiæ not spined.
a^5. Eyes hairy .. .. *Mominæ.*
b^5. Eyes not hairy.
a^6. Eyes with long overhanging cilia .. *Plusianæ.*
b^6. Eyes not ciliated.
a^7. Hindwing with vein 5 from close to lower angle of cell, strong .. *Noctuinæ.*
b^7. Hindwing with vein 5 from well above angle of cell, rather weak *Erastrianæ.*
b^1. Hindwing with vein 5 parallel to 4 .. .. *Hypeninæ.*
B. Maxillary palpi present .. .. *Hyblæinæ.*

Sub-Family AGROTINÆ.

A. Frons with rounded prominence.
a. Fore tibiæ with stout apical claws.
a^1. Forewing rather long and narrow .. .. *Timora.*
b^1. Forewing rather short and broad .. .. *Raghuva.*
b. Fore tibiæ with slender apical claws .. .. *Melicleptria.*
c. Fore tibiæ without claws .. .. *Adisura.*
B. Frons without rounded prominence .. .. *Agrotis.*

Genus TIMORA.

Type.
Timora, Wlk. ix. 132 (1856) ... ... *senegalensis.*

A. Forewing with oblique interrupted postmedial pink band with white points on it .. .. *leucosticta.*
B. Forewing with pink fasciæ below costa and above inner margin *lanceolata.*

(1) Timora leucosticta, n. sp.

♂. Ochreous; thorax with some pink hair behind tegulæ; fore coxæ and femora and tibiæ pink above. Forewing with diffused pink fasciæ below costa and in base of cell; an antemedial pink patch with white point on it on vein 1; an oblique pink bank with white points on it from apex to inner margin beyond middle interrupted in discal and submedian folds; cilia pink.

Hab. N'Gamiland (Lugard). *Exp.* 26 mill. Type in B.M.

(2) Timora lanceolata, Wlk. xxxiii. 767 (1865).

Curubasa depicta, Swinh. Trans. Ent. Soc. 1891, p. 146, pl. 8, f. 4.

Hab. West Africa, Niger R.; Mashonaland, Salisbury (Marshall); Natal, Malvern (Marshall). *Exp.* ♂ 24–30, ♀ 30–40 mill.

Genus RAGHUVA.

Type.

Raghuva, Moore, P.Z.S. 1881, p. 362 ... *confertissima*.

Raghuva multiradiata, n. sp.

Head and thorax grey-brown tinged with fulvous. Forewing pale olive-brown; the subbasal line indistinct; the antemedial line sinuous, dentate above inner margin and with some rufous on its inner side; claviform large and elongate with whitish streak in centre and defined by brown; a whitish streak in cell with the small orbicular below it with dark centre and defined by brown; reniform large with black centre and defined by black; postmedial line minutely dentate with series of white points on it, bent outwards below costa and incurved below vein 3 with some rufous or dark suffusion beyond it; the veins of terminal area with black streaks on dentate whitish marks extending to termen; a series of small terminal black spots in the interspaces; cilia pale with a dark line at base. Hindwing yellowish brown; cilia pale with a dark line at base; the under side ochreous with dark discoidal lunules, slightly sinuous postmedial line, and terminal series of small black lunules.

Hab. British East Africa, Eb Urru, Athi R. (Betton); Mashonaland, Salisbury (Marshall); Transvaal. *Exp.* 30 mill. Type in B.M.

Genus MELICLEPTRIA.

Type.

Melicleptria, Hübn. Verz. p. 262 (1827) ... ... *scutosa*.

A. Forewing yellow, the inner area tinged with rufous and fuscous *xanthiata*.
B. Forewing ochreous or brownish.
  a. Forewing without terminal black spot above tornus.
    a^1. Forewing with series of white points on the dark postmedial band .. .. *scutiligera*.
    b^1. Forewing without series of white points on the postmedial band .. .. *armigera*.
  b. Forewing with terminal black spot above tornus .. .. .. *peltigera*.

(1) Melicleptria xanthiata, Wlk. xxxiii. 770 (1865).
Hab. Natal, Karkloof (Marshall). *Exp.* 36 mill.

(2) Melicleptria scutiligera, Guen. Noct. ii. p. 180 (1852).
Heliothis errans, Wlk. xxxiii. 769 (1865).
Hab. Natal, Durban (Leigh); Cape Colony, Knysna (Trimen), Annshaw (Miss F. Barrett); O'okiep (Lightfoot). *Exp.* 30 mill.

(3) Melicleptria armigera, Hübn. Samml. Eur. Schmett. Noct. ii. pl. 79, f. 3 (1827).
Heliothis pulverosa, Wlk. xi. 688 (1857).
,, *uniformis*, Wllgrn. Wien. Ent. Mon. iv. p. 171 (1860).
Hab. Almost universally distributed: N'Gamiland (Lugard); Transvaal (Ross); Natal, Malvern (Marshall), Durban (G. F. Leigh); Cape Colony, Knysna, Capetown (Trimen). *Exp.* 31–41 mill.

(4) Melicleptria peltigera, Schiff. Wien. Verz. p. 82 (1776).
Phalæna charmione, Stoll, Cram. Pap. Exot. v. p. 162, pl. 36, f. 10 (1791).
Hab. Southern Europe; North Africa; Canaries; Cape Colony; Armenia; Syria; Persia; Northern India. *Exp.* 34–40 mill.

Genus ADISURA.

	Type.
Adisura, Moore, P.Z.S. 1881, p. 367	*atkinsoni.*

A. Forewing yellowish white .. .. *straminea.*
B. Forewing pale green .. .. *ærugo.*

(1) Adisura straminea, n. sp.
♂. Yellowish white, palpi above and lower part of frons brownish; abdomen dorsally tinged with ochreous. Forewing irrorated with a very few black scales; the inner and terminal areas tinged with ochreous; slight traces of a brownish streak from lower angle of cell to termen and of an obliquely curved postmedial series of dark points. Hindwing semihyaline, the terminal area tinged with ochreous.
Hab. N'Gamiland (Lugard). *Exp.* 26 mill. Type in B.M.

(2) Adisura ærugo, Feld. Reis. Nov. pl. 108, f. 45 (1874).
Hab. Mashonaland, Salisbury (Marshall); Cape Colony, Annshaw (Miss F. Barrett). *Exp.* 26 mill.

Genus AGROTIS.

	Type.
Agrotis, Ochs. Schmett. Eur. iv. p. 66 (1816), non descr.	*rectangula.*
Agrotis, Treit. Schmett. Eur. v. 1, p. 125 (1825)	*rectangula.*
Chera, Hübn. Verz. p. 211 (1827)	*serratilinea.*
Peridroma, Hübn. Verz. p. 227 (1827)	*saucia.*

Sect. I. Antennæ of male with moderate branches, the apical part serrate.

A. Forewing with the ground colour grey-brown to fuscous .. .. .. *segetis.*
B. Forewing with the ground colour grey-white .. .. *subalba*

(1) Agrotis segetis, Schiff. Wien. Verz. p. 252, id. Wien. Verz. 81, 12 f. 3, a. b. (1776). Larva Fawcett. Trans. Z. S. xv. vi. p. 317, pl. 49, f. 16 (1901).
Agrotis marginalis, Wlk. x. 339 (1856).
,, *obliviosa*, Wlk. x. 339 (1856).
,, *denticulosa*, Wllgrn. Wien. Ent. Mon. iv. p. 168 (1860).
Hab. Europe; Mashonaland, Salisbury (Marshall); Natal, Estcourt (Hutchinson, Kraus); Cape Colony (Drège, A. Smith); India; Ceylon. *Exp.* 42–48 mill.

(2) Agrotis subalba, Wlk. x. 339 (1856).
,, *nivalis*, Feld. Reis. Nov. pl. 110, f. 11 (1874).
Hab. Cape Colony (Drège). *Exp.* 44 mill.

Sect. II. Antennæ of male with very short branches, the apical part serrate.

(3) Agrotis spinifera, Hübn. Samml. Eur. Schmett. Noct. f. 389 (1827).
Agrotis spiculifera, Guen. Noct. 1, p. 266 (1852).
,, *ferina*, Feld. Reis. Nov. pl. 110, f. 12 (1874).
Hab. Southern Europe; Eritrea; British East Africa; Mashonaland, Salisbury (Marshall); Transvaal (Ross); Natal, Estcourt (Hutchinson); Cape Colony (Drège, A. Smith); Persia; India, Ceylon, and Burma. *Exp.* 38 mill.

Sect. III. Antennæ of male ciliated.

A. Forewing without very highly dentate antemedial line emitting teeth to the base.
a. Forewing with well-defined blackish or deep black antemedial, medial, and postmedial patches on costa; colour grey-white, usually tinged with green; thorax purplish red or black .. .. *muscosa.*
b. Forewing without well-defined black patches on costa.
a^1. Forewing with black fascia from base below and in the cell to the orbicular stigma.
a^2. Tegulæ with black patch .. .. *atritegulata.*
b^2. Tegulæ without black patch .. .. *plecta.*
b^1. Forewing with triangular black patches in cell before the orbicular and reniform stigmata .. .. *bitriangula.*

c^1. Forewing with quadrate black patch in cell between the stigmata .. .. *isopleura.*
d^1. Forewing without black fascia or patch in cell.
a^2. Forewing grey, suffused with olive-green and irrorated with black .. .. *oliveata.*
b^2. Forewing without olive-green tinge.
a^3. Forewing with the ground colour greyish.
a^4. Forewing irrorated with fine dark scales .. .. *postventa.*
b^4. Forewing much more thickly irrorated with groups of scales .. .. *perirrorata.*
b^3. Forewing with the ground colour brownish.
a^4. Forewing almost entirely suffused with black *fumicolor.*
b^4. Forewing strongly irrorated and striated with black .. .. *mesomelana.*
c^4. Forewing with slight dark irroration.
a^5. Forewing without terminal series of black points .. .. *crassilinea.*
b^5. Forewing with prominent terminal series of black points.. .. .. *cinctithorax.*

B. Forewing with very highly dentate antemedial line emitting teeth to base.
a. Forewing without streaks in interspaces of terminal area.
a^1. Forewing with series of white points on the postmedial line .. .. *puncticostata.*
b^1. Forewing without series of white points on the postmedial line .. .. *indigna.*
b. Forewing with streaks in interspaces of terminal area.
a^1. Forewing with the inner area suffused with blue-grey *interstriata.*
b^1. Forewing with the inner area not tinged with blue grey.
a^2. Forewing with black fascia from orbicular to reniform and thence to termen.
a^3. Forewing with the costal area blackish .. .. .. *sicca.*
b^3. Forewing with the costal area not blackish .. .. *effracta.*
b^2. Forewing without well-marked black fascia.
a^3. Forewing with black mark between the orbicular and reniform .. .. *dispalata.*
b^3. Forewing without black mark between the orbicular and reniform .. .. *strigibasis.*

(4) Agrotis muscosa, Geyer Samml. exot. Schmett. 10, 414, ff. 827, 828 (1827).
Agrotis albifrons, Geyer Samml. exot. Schmett. 17, 430, ff. 859, 860 (1827).
Agrotis rimosa, Guen. Noct. i. p. 277 (1852).
Diphthera cumulata, Wlk. ix. 613 (1856).
Agrotis ignicollis, Wlk. xi. 740 (1857).
,, *amatura*, Wlk. xv. 1700 (1858).
,, *varia*, Wlk. xxxii. 694 (1865.)
Dianthœcia æramen, Feld. Reis. Nov. pl. 109, f. 15 (1874).
Agrota decipiens, Feld. Reis. Nov. pl. 110, f. 17 (1874).

Hab. Galla Country; Transvaal (Ross); Natal (Smith, Gooch), Estcourt (Hutchinson), Durban (Leigh); Cape Colony, Transkei (Miss F. Barrett), Knysna, Cape Town (Gueinzius, Trimen); Madagascar. *Exp.* 36–42 mill.

(5) Agrotis atritegulata, n. sp.

♂. Head ochreous white; palpi blackish except at tips; thorax ochreous white tinged with rufous, the tegulæ with large black patch and without rufous tinge; legs tinged with brown; abdomen ochreous white slightly irrorated with fuscous. Forewing grey, the costal area ochreous white irrorated with fuscous, the costal edge ochreous; some whitish at base of inner margin; a black fascia in and below cell to the orbicular and thence to the reniform, which is defined on outer side by black. Hindwing pure white.

Hab. Transvaal (Ross). *Exp.* 38 mill. Type in B.M.

(6) Agrotis plecta, Linn. Syst. Nat. x. p. 851 (1758).
Ochropleura vicaria, Wlk. x. 409 (1856).
Hab. North America; Europe; Cape Colony (Dr. A. Smith); Japan; India; Ceylon. *Exp.* 34 mill.

(7) Agrotis bitriangula, n. sp.

Grey; palpi black except at tips; antennæ blackish; tegulæ black, edged with grey. Forewing purplish grey, irrorated with a few black and red scales; an indistinct sinuous antemedial line bent outwards to inner margin; truncate triangular white-edged black spots in cell before the orbicular and reniform, which are almost obsolete, a few black scales below the former and beyond the latter; a pale sinuous subterminal line ending at tornus.

Hab. Cape Colony, Transkei (Miss F. Barrett). *Exp.* 36 mill. Type in B.M.

(8) Agrotis isopleura, n. sp.

♀. Head and thorax grey, the scales pencilled with brown; palpi except at tips and sides of frons black; abdomen grey. Forewing grey, irrorated with fuscous and tinged with fuscous on costal and terminal areas; an indistinct double waved antemedial line; the orbicular and reniform grey incompletely defined by black scales and with quadrate black patch between them; a sinuous line from lower angle of cell to inner margin; an indistinct double waved postmedial line bent outwards below costa. Hindwing semihyaline white.

Hab. Mashonaland, Salisbury (Marshall). *Exp.* 30 mill. Type in B.M.

(9) Agrotis oliveata, n. sp.

♂. Head and thorax olive-yellow irrorated with black; pectus, legs, and abdomen greyish ochreous. Forewing pale grey-brown suffused with olive-yellow and irrorated with black; a series of small black spots on costa; a minutely dentate antemedial black line angled outwards below the cell and inwards on vein 1; the orbicular and reniform black-edged, the former round, the latter large; a highly dentate black postmedial line, bent outwards from below costa to vein 3; traces of a dentate subterminal line; a terminal series of black points. Hindwing whitish tinged with brownish ochreous; traces of a curved postmedial line and of a diffused subterminal band; a fine brown terminal line. Under side of both wings with dark postmedial line, curved and punctiform on hindwing.

Hab. **Cape Colony.** *Exp.* 42 mill. Type in B.M.

(10) Agrotis postventa, Hübn. Samml. Exot. Schmett. iii. ff. 865, 866.

Hab. **Cape Colony; Namaqualand.** *Exp.* ♂ 40, ♀ 52 mill.

(11) Agrotis perirrorata, n. sp.

Brownish grey; palpi and frons blackish; head and thorax thickly irrorated with black; abdomen tinged with fuscous. Forewing thickly irrorated with groups of brown scales; traces of a sinuous antemedial line angled inwards on vein 1; orbicular and reniform rather obscure and blackish, the former small or minute, the latter rather small; an indistinct punctiform postmedial line bent outwards below costa and obtusely angled inwards at vein 5 and outwards at vein 4; slight dark marks on costa and a rather more distinct somewhat triangular patch beyond the postmedial line; a prominent terminal series of black points. Hindwing ochreous white with terminal series of black points.

Hab. **Mashonaland,** Salisbury (Marshall); **Natal,** Estcourt (Hutchinson); **Cape Colony,** Transkei (Miss F. Barrett). *Exp.* 34 mill. Type in B.M.

(12) Agrotis fumicolor, n. sp.

Head rufous mixed with black; thorax fuscous black, a slight rufous metathoracic tuft; abdomen grey, dorsally suffused with fuscous black leaving slight segmental lines, the anal tufts of male rufous. Forewing brownish almost entirely suffused with fuscous black; the black lines and stigmata hardly traceable. Hindwing

semihyaline white; the costal area tinged with fuscous; a postmedial series of slight striæ on the veins.

Hab. Mashonaland, Salisbury (Marshall). *Exp.* 28 mill. Type in B.M.

(13) Agrotis mesomelana, n. sp.

♂. Head and thorax brown suffused with black; abdomen brown tinged with fuscous. Forewing pale red-brown thickly irrorated with groups of black scales; an obscure short waved subbasal line and more distinct antemedial line; the medial area suffused with black from costa to below the large orbicular and reniform and small claviform stigmata; the postmedial black line bent outwards below costa, incurved beyond cell and excurved at median nervules, emitting very short streaks on the veins; a diffused dark sinuous terminal band and series of black terminal points. Hindwing white slightly tinged with ochreous; a fine fuscous terminal line.

♀. Hindwing strongly suffused with fuscous; the cilia brownish.

Hab. Natal, Estcourt (Hutchinson); Cape Colony, Transkei (Miss F. Barrett). *Exp.* ♂ 32, ♀ 40 mill. Type in B.M.

*(14) Agrotis crassilinea, Wllgrn. Wien. Ent. Mon. iv. p. 168 (1860).

Hab. Cape Colony. *Exp.* 36 mill.

(15) Agrotis cinctithorax, Wlk. xi. 591 (1857).

Hab. Cape Colony (Dr. A. Smith). *Exp.* 34 mill.

(16) Agrotis punctico̱stata, n. sp.

♂. Head and thorax brown suffused with black; legs black with white rings on tibiæ and tarsi; abdomen greyish brown. Forewing ferruginous brown with the medial area below the cell pale brownish grey; a series of prominent pale points on costa; an indistinct dentate antemedial line emitting teeth to the base in and below cell; the orbicular and reniform rather small with black centres and pale annuli defined by fine black lines; the postmedial line fine, black, strongly dentate, the teeth ending in white points, bent outwards below costa and slightly incurved below vein 3; traces of an irregular pale subterminal line; the veins of terminal area streaked with black; a fine black terminal line; cilia chequered brownish and black. Hindwing pure white, the costal area tinged with brown; a discoidal spot and postmedial series of points on the veins more distinct on under side.

Hab. British East Africa, Athi R. (Betton); Natal, Estcourt (Hutchinson). *Exp.* 28–30 mill. Type in B.M.

(17) Agrotis indigna, Herr Schäff. Lep. Exot. f. 130 (1850).
,, *dividens* Wlk. x. 342 (1856).
Axylia intendens, Wlk. xi. 717 (1857).
Hab. British East Africa; Natal (Kraus); Cape Colony, Annshaw (Miss F. Barrett). *Exp.* 32–36 mill.

(18) Agrotis interstriata, n. sp.
Head and thorax black, sides of head with whitish lines; tibiæ and tarsi ringed with white; abdomen fuscous with fine pale segmental lines. Forewing with the basal two-thirds fuscous black suffused with blue-grey on inner half; a fine black very highly dentate antemedial line emitting teeth almost to the base on median nervure and vein 1; the orbicular a minute black-edged white spot; the reniform small with black centre and whitish annulus defined by a black line; the terminal area cupreous brown with dark streaks on the veins and brown streaks in the interspaces, the costal area blackish with series of white points; cilia chequered black and pale brown. Hindwing white; the costal area tinged with fuscous.
Hab. Mashonaland, Salisbury (Marshall); Natal, Weenen, Karkloof (Marshall); Cape Colony, Transkei (Miss F. Barrett). *Exp.* 30 mill. Type in B.M.

(19) Agrotis sicca, Guen. Noct. i. p. 135 (1852).
Axylia renalis, Moore, P.Z.S. 1881, p. 341.
Agrotis transjecta, Dist. A.M.N.H. (7) 1, p. 220 (1898).
Hab. Transvaal, Pretoria (Distant); Cape Colony, Transkei (Miss F. Barrett). North-West India. *Exp.* 36 mill.

(20)*Agrotis effracta, Dist. A.M.N.H. (7) 1, p. 220 (1898).
Hab. Transvaal, Pretoria (Distant). *Exp.* 34 mill.

(21) Agrotis dispalata, Swinh. Trans. Ent. Soc. 1891, p. 145.
Hab. British East Africa; Mashonaland, Salisbury (Marshall); Natal, Karkloof (Marshall). Madagascar; India. *Exp.* 28 mill.

(22) Agrotis strigibasis, n. sp.
Red-brown; head and thorax variegated with dark red-brown. Forewing with series of dark and pale points on costa; a highly dentate antemedial line emitting teeth to the base in and below cell; the orbicular, reniform and claviform moderate in size, fuscous with

pale annuli defined by a black line; an indistinct dentate postmedial line strongly bent outwards below costa, excurved to vein 3, then incurved; the terminal area with blackish streaks on the veins and brown streaks in the interspaces; a terminal series of black points. Hindwing yellowish white, the costa and termen more tinged with ochreous.

Forewing with the costal area suffused with black in the East African and Mashonaland form and in the male the medial area suffused with fuscous.

Hab. British East Africa, Athi-ya-Mawe (Betton); Mashonaland, Salisbury (Marshall); Cape Colony, Annshaw (Miss F. Barrett). *Exp.* 30 mill. Type in B.M.

AUCTORUM.

Agrotis bilix, Guen. Noct. i. p. 277 (1852) Cape Colony.
,, *lanidorsa*, Guen. Noct. i. p. 283 (1852) ... ... Cape Colony.

SUB-FAMILY MAMESTRINÆ.

A. Abdomen with dorsal crests of scales .. .. *Mamestra.*
B. Abdomen without dorsal crests.
  a. Frons with disk-shaped prominence with raised centre .. *Aspidifrontia.*
  b. Frons without prominence.
    a^1. Proboscis aborted, minute .. .. *Diaphone.*
    b^1. Proboscis fully developed .. .. *Leucania.*

GENUS MAMESTRA.

Type.
Mamestra, Ochs. Schmett. Eur. p. 76 (1816), non descr.
Mamestra, Hübn. Verz. p. 214 (1827) ... ... *pisi.*

A. Forewing with pale ochreous or whitish fascia on middle of inner margin.
  a. Forewing with subterminal series of dentate whitish and black spots .. .. *vittigera.*
  b. Forewing with pale subterminal line, highly dentate between median nervules .. .. *speyeri.*
B. Forewing without pale fascia on middle of inner margin.
  a. Forewing with the ground colour not white tinged with green.
    a^1. Forewing with the medial area greyish and paler than the ground colour.
      a^2. Forewing with whitish streaks on the veins of medial area .. .. *bulgeri.*

b^2. Forewing without pale streaks on the veins of medial area .. .. *mesoglauca.*
b^1. Forewing with the medial area not paler than the ground colour.
a^2. Forewing very dark red-brown with pale patch on inner area before tornus .. .. *dipterigidia.*
b^2. Forewing without pale patch on inner area before tornus.
a^3. Forewing with the ground colour brown or grey-brown.
a^4. Forewing with the subterminal line dentate at middle.
a^5. Forewing with pale dentate line before the irregular blackish terminal band .. .. *renisigna.*
b^5. Forewing without pale line before the blackish terminal band.
a^6. Forewing with the costal half of post-medial line not dentate .. .. *consanguis.*
b^6. Forewing with the costal half of post-medial line dentate .. .. *definiens.*
b^4. Forewing with the subterminal line not dentate at middle .. .. *furvilinea.*
b^3. Forewing whitish tinged with olive-brown and irrorated with black .. .. *natalensis.*
b. Forewing with the ground colour white tinged with grey-green .. .. *poliastis.*

(1) Mamestra vittigera, n. sp.

♂. Head and thorax dark red-brown and purplish fuscous; abdomen reddish brown. Forewing purplish grey; a pale subbasal line defined by black between median nervure and vein 1; the antemedial line brownish defined by black lines, slightly curved and with the large black claviform stigma on its outer edge; the medial area pinkish; the orbicular and reniform whitish, the former minute, the latter large attenuate, its centre defined by brownish lines and with some black in the cell before it; a whitish fascia on middle of inner area and a paler streak on basal part of vein 2; the postmedial line formed of minute pale and black lunules, strongly bent outwards below costa; a subterminal series of black and ochreous dentate spots; the termen brown with whitish apical patch. Hindwing white, the costal area tinged with brown; a fine brown terminal line.

♀. Hindwing fuscous.

The specimen from British East Africa has a prominent white fascia on terminal part of median nervure and base of vein 2.

Hab. British East Africa, Athi-ya-Mawe (Betton); Natal, Victoria District (Gooch), Northdene. *Exp.* 30–34 mill. Type in B.M.

(2) Mamestra speyeri, Feld. Reis. Nov. pl. 110, f. 15 (1874).

Hab. Natal, Estcourt (Hutchinson), Durban (Leigh); Cape Colony, Queenstown. *Exp.* 40 mill.

(3) Mamestra bulgeri, Feld. Reis. Nov. pl. 110, f. 18 (1874).
Hab. Natal, Estcourt (Hutchinson); Cape Colony, Queenstown.
Exp. 38 mill.

(4) Mamestra mesoglauca, n. sp.

♀. Head and thorax dark purplish brown mixed with black and white scales; tarsi with whitish bands; abdomen greyish, red-brown on terminal half and ventral surface. Forewing dark purplish brown mixed with grey and black scales; some black points on basal part of costa and a black streak below base of cell; the medial area whitish irrorated with black, defined in inner side by the sinuous interrupted black antemedial line and on outer side by the waved postmedial line which is excurved from costa to vein 3, then incurved, the orbicular, reniform and claviform white defined by black lines, the two former with the area between them purplish brown; some pale points on costa towards apex; an irregular ochreous white subterminal line with ochreous patch at apex and ≷-mark at middle; a crenulate black terminal line; cilia fuscous with two ochreous white lines through them. Hindwing fuscous with the basal area whitish; cilia whitish.

Hab. Natal, Durban (Innes); Cape Colony, Annshaw (Miss F. Barrett). *Exp.* 36 mill. Type in B.M.

(5) Mamestra dipterigidia, n. sp.

Head and thorax dark red-brown mixed with black; abdomen fuscous, the anal tuft rufous and ochreous. Forewing dark red-brown suffused with black; traces of some black points on costa and of a sinuous antemedial line, the orbicular and reniform rather small, black-edged and indistinct; the claviform represented by an obscure blackish streak; the postmedial black line crenulate, excurved from costa to vein 3 and with a reddish ochreous patch beyond it on inner area extending to tornus; some pale points on costa towards apex and a series of indistinct dentate subterminal black marks; a pale waved line at base of cilia. Hindwing fuscous, paler towards base; cilia pale with a fuscous line through them.

Hab. Cape Colony, Annshaw (Miss F. Barrett). *Exp.* 42 mill. Type in B.M.

(6) Mamestra renisigna, Wlk. x. 267 (1856).
Dianthœcia prætermissa, Wlk. xi. 506 (1857).
Hadena depulsa, Wlk. xi. 590 (1857).
,, *inculta*, Wlk. xxxiii. 727 (1865).

Hadena ficita, Wlk. xxxiii. 734 (1865).
,, *contracta*, Wlk. xxxiii. 735 (1865).
,, *servilis*, Wlk. xxxiii. 736 (1865).
Hab. British East Africa, Machakos; Mashonaland, Salisbury (Marshall); Delagoa Bay (H. Junod); Natal, Estcourt (Hutchinson), Durban (Leigh); Cape Colony (A. Smith, Drège, Trimen). *Exp.* 34 mill.

(7) Mamestra consanguis, Guen. Noct. ii. p. 97 (1852).
Hadena languida, Wlk. xv. 728 (1858.)
Hab. West Africa, Congo; British East Africa; Mashonaland, Salisbury (Marshall); Natal, Estcourt (Hutchinson); Cape Colony, Transkei (Miss F. Barrett); India; Ceylon. *Exp.* 32 mill.

(8) Mamestra definiens, Wlk. xi. 689 (1857).
Hab. Cape Colony (Dr. Smith); O'okiep. *Exp.* 36 mill.

(9) Mamestra furvilinea, n. sp.
♀. Head and thorax purplish red, the scales tipped with grey; abdomen grey-brown. Forewing clothed with blackish, purplish red, brown and grey scales; an indistinct pale antemedial line incurved to costa; the orbicular and reniform with grey outlines and brown patches beyond them; traces of a postmedial line curved from costa to vein 4, then slightly bent inwards; the subterminal line whitish with rufous on its inner edge, somewhat bent outwards at vein 7. Hindwing white, the veins and terminal area tinged with fuscous; a fuscous line at base of cilia except towards tornus.
Hab. Mashonaland, Salisbury (Marshall); Cape Colony, Transkei (Miss F. Barrett). *Exp.* 38 mill. Type in B.M.

(10) Mamestra natalensis, Butl. A.M.N.H. (4) xvi. p. 403 (1875).
Hab. Natal (Burrows), Durban (Leigh). *Exp.* 32 mill.

(11) Mamestra poliastis, n. sp.
Head and thorax white tinged with green and irrorated with black; antennæ ringed with black; abdomen tinged with black above, leaving white segmental lines. Forewing white tinged in part with grey-green and irrorated with black scales; a short bisinuate subbasal black line; a waved medial line dentate inwards on median nervure and vein 1; a discoidal lunule; a dentate postmedial line excurved

between veins 5 and 2 and strongly incurved between veins 2 and 1, the area between it and medial line often suffused with black from vein 2 to inner margin; a terminal series of black points. Hindwing white with fuscous suffusion on terminal area.

Hab. British East Africa, Machakos (Crawshay), Nairobi (Betton); Mashonaland, Salisbury (Marshall); Transvaal, Pretoria (Distant); Cape Colony, Transkei (Miss F. Barrett). *Exp.* 28 mill. Type in B.M.

Auctorum.

Dianthœcia submœsta, Möschl. Verh. z. b. Ges. Wien. xxxiii. p. 294, pl. xvi., f. 8... Natal, Cape Colony.

Mamestra ordinaria, Wlk. xxxii. 664 (1865), type lost ... ... South Africa.

Mamestra catephioides, Wlk. xxxii. 665 (1865), type lost ... ... South Africa.

Genus ASPIDIFRONTIA, nov.

Type *A. semipallida*.

Proboscis rather weak; palpi porrect to just beyond frons and fringed with hair below; frons with large disk-shaped corneous prominence with truncate conical centre; eyes hairy; antennæ of male ciliated; legs hairy. Forewing with veins 3 and 5 from near angle of cell; 6 from upper angle; 9 from 10 anastomosing with 8 to form the areole; 11 from cell. Hindwing with veins 3, 4 from angle of cell; 5 obsolescent from middle of discocellulars; 6, 7 from upper angle.

A. Forewing blackish with the costal half pale .. .. *semipallida.*
B. Forewing pale, thickly irrorated with rufous .. .. *rufescens.*

(1) Aspidifrontia semipallida, n. sp.

Head and thorax black; antennæ ochreous white; tarsi ringed with ochreous; abdomen ochreous white, the ventral surface black. Forewing black suffused with leaden grey especially towards inner margin; the costal area ochreous white, suffused with purplish pink towards costa and with black patch with three pale points on it on costa before apex, on basal area the pale colour extends to just below the cell, on medial area to median nervure, and on postmedial area to vein 5, and includes a black point in lower end of cell; an oblique crenulate postmedial line obsolete on costal area, with a rufous band

on its outer edge extending to the waved black subterminal line which is bent outwards to apex and excurved at middle; a terminal series of black and white points. Hindwing yellowish white, the apex slightly tinged with fuscous.

Hab. Mashonaland, Umtali (Marshall). *Exp.* 34 mill.

(2) Aspidifrontia rufescens, n. sp.

♀. Head and thorax whitish mixed with brown; frontal prominence blackish and long; abdomen ochreous white. Forewing ochreous-white thickly irrorated with purplish red; the veins irrorated with black; traces of an antemedial line; a point in end of cell; an obscure double postmedial series of white points on the veins excurved below costa, then oblique; a terminal series of black points. Hindwing yellowish white, the terminal area suffused with brown.

Hab. Mashonaland, Umtali (Marshall). *Exp.* 34 mill. Type in B.M.

Genus DIAPHONE.

	Type.
Diaphone, Hübn. Verz. p. 188 (1827)	*eumela.*

A. Forewing with the discoidal spot crimson . .. . *eumela.*
B. Forewing with the discoidal spot not crimson .. .. *dominica.*

(1) Diaphone eumela, Stoll. Pap. Exot. iv. pl. 347, g (1781). Larva Fawcett, Trans. Z.S. xv. vi. p. 318, pl. 49, ff. 20, 21 (1901).
Bombyx elegans, Fabr. Mant. Ins. ii. p. 116 (1787).
Noctua sylviana, Stoll. Suppl. Cram. pl. 40, f. 4 (1790).
Chelonia evidens, Guér. Icon. R. Anim. Ins. p. 513, pl. 88, f. 1 (1829).
Hab. Senegal; British East Africa, Wadelai; Portuguese East Africa, Chiperoni; Natal (Gooch), Newcastle, Karkloof (Marshall); Basutoland, Masitz (Weigall); Cape Colony. *Exp.* 38–46 mill.

(2) Diaphone dominica, Cram. Pap. Exot. iv. pl. 399, H. (1783). Larva Fawcett, Trans. Z.S. xv. v. p. 317, pl. 49, ff. 17, 18 (1901).
Hab. Mashonaland, Salisbury (Marshall); Transvaal, Pretoria (Distant); Natal, Durban (Leigh); Cape Colony, Grahamstown; Mauritius; India; Ceylon; Burma; Java. *Exp.* 36–38 mill.

Genus LEUCANIA.

Type.

Leucania, Ochs. Eur. Schmett. iv. p. 81 (1816) *comma*.

A. Forewing with fine dark streaks in the interspaces of terminal area.
  a. Forewing with white streak on terminal part of median nervure.
    a^1. Forewing with the streak emitting a short hook on discocellulars.
      a^2. Forewing with the streak short and confined to extremity of median nervure .. .. *interciliata*.
      b^2. Forewing with the streak long and extending towards base.
        a^3. Forewing with the ground colour pinkish .. .. *sarca*.
        b^3. Forewing with the ground colour ochreous .. .. *amens*.
    b^1. Forewing with the streak not hooked.
      a^2. Forewing with the streak short and dilated at extremity .. .. *rhabdophora*.
      b^2. Forewing with the streak long and emitting streaks on veins 3, 4.
        a^3. Forewing with the ground colour pinkish grey .. *albicosta*.
        b^3. Forewing with the ground colour reddish ochreous.
          a^4. Forewing with black streak in end of submedian fold .. .. *plana*.
          b^4. Forewing without black streak in end of submedian fold.
            a^5. Forewing with prominent white terminal line .. .. *tincta*.
            b^5. Forewing without terminal white line.
              a^6. Forewing with reddish streak in end of cell and discal fold .. .. *infima*.
              b^6. Forewing without reddish streak in cell and discal fold .. .. *torrentium*.
  b. Forewing with white point at lower angle of cell .. .. .. *loreyi*.
B. Forewing without fine dark streaks in interspaces of terminal area.
  a. Forewing with more or less prominent white streak on extremity of median nervure.
    a^1. Forewing with the streak emitting a short hook on discocellulars.
      a^2. Forewing without two black points above middle of median nervure .. .. *apparata*.
      b^2. Forewing with two black points above middle of median nervure .. .. *irrorata*.
    b^1. Forewing with the streak not hooked.
      a^2. Forewing without black fascia below median nervure.
        a^3. Forewing reddish brown with more or less prominent oblique reddish streak from apex .. .. *usta*.
        b^3. Forewing ochreous without reddish streak from apex.
          a^4. Forewing without black spot beyond lower angle of cell.
            a^5. Forewing not clouded with pale fuscous marks in the interspaces .. .. *nigrisparsa*.
            b^5. Forewing clouded with pale fuscous marks in the interspaces .. .. *nebulosa*.
          b^4. Forewing with black spot beyond lower angle of cell .. .. *atrimacula*.
      b^2. Forewing with black fascia below median nervure .. *tacuna*.
  b. Forewing with white point at lower angle of cell.

a^1. Forewing with crenulate postmedial line .. .. *phæa.*
b^1. Forewing with postmedial series of points .. .. *unipuncta.*
c. Forewing with black fasciæ on median nervure and vein 1 *interlata*

(1) Leucania interciliata, n. sp.

♂. Head and thorax ochreous white slightly tinged with brown; palpi and legs mixed with black; prothoracic crest black and white at tips; abdomen strongly tinged with brown. Forewing pale brownish ochreous, the costal area irrorated with black; a purplish-brown fascia on median nervure and in cell, then diffused over the whole terminal area, the median nervure itself grey with a white streak at extremity emitting a short hook on discocellulars; a purplish brown and greyish fascia on vein 1 from near base and with an oblique black streak below it from near base to middle; the terminal area with fine red-brown streaks in the interspaces, a grey fascia, with a black streak below it, on vein 5, and a blackish streak in end of submedian fold; fine white streak on the ends of the veins and intersecting the cilia which are black. Hindwing white tinged with ochreous; the terminal area and veins tinged with brown; the cilia brown and white except towards tornus.

Hab. Natal, Estcourt (Hutchinson). *Exp.* 40 mill. Type in B.M.

(2) Leucania sarca, n. sp.

Head, thorax, and abdomen white, tinged with pink and brown and irrorated with black. Forewing white strongly tinged with pink and irrorated with black; the costal edge and a fascia on median nervure brownish pink, the median nervure with white streak from before middle to extremity where it emits a slight hook, a black fascia above it continued above vein 5 to termen; a black point in lower angle of cell; a short black streak in base of submedian fold; the interspaces of terminal area with fine dark streaks ending in black points. Hindwing white, the apical area suffused with fuscous to submedian fold; traces of some terminal points.

Hab. British East Africa, Machakos (Crawshay); Natal, Karkloof (Marshall); Cape Colony, Transkei (Miss F. Barrett). *Exp.* 28 mill. Type in B.M.

(3) Leucania amens, Guen. Noct. i. p. 88 (1852).

Hab. British East Africa, Machakos; Natal, Estcourt (Hutchinson); Cape Colony, Transkei, Annshaw (Miss F. Barrett). *Exp.* 34–36 mill.

(4) Leucania rhabdophora, n. sp.

Head, thorax, and abdomen pale ochreous strongly mixed with black-brown. Forewing pale ochreous; the veins defined by black streaks; brownish streaks in the interspaces; a white streak somewhat dilated at extremity on end of median nervure; a curved postmedial series of black points; the interspaces of terminal area with fine dark streaks; an oblique shade below apex. Hindwing whitish, the terminal half and veins strongly tinged with fuscous.

Hab. Cape Colony, Transkei (Miss F. Barrett). *Exp.* 32 mill. Type in B.M.

(5) Leucania albicosta, Moore, P.Z.S., 1881, p. 338, pl. 37, f. 10.

Hab. Natal, Estcourt (Hutchinson); India; Ceylon; Burma; Singapore. *Exp.* 28–39 mill.

(6) Leucania plana, Wlk. ix. 102 (1856).

Hab. Natal, Estcourt (Hutchinson); Cape Colony (Dr. A. Smith). *Exp.* 34–38 mill.

(7) Leucania tincta, Wlk. xv. 1660 (1858).

Hab. Natal (Gueinzius), Estcourt (Hutchinson). *Exp.* 38 mill.

(8) Leucania infima, Wllgrn. Œfv. Vet. Akad. Förh. 1875, p. 106.

Hab. British East Africa, Sabaki Valley, Machakos; Transvaal; Natal, Estcourt (Hutchinson), Durban (Gueinzius, Leigh); Cape Colony (Dr. A. Smith). *Exp.* 32–36 mill.

(9) Leucania torrentium, Guen. Noct. i. p. 88 (1852).

,, *substituta*, Wllgrn. Œfv. Vet. Akad. Förh. 1875, p. 105.

Hab. West Africa, Niger River; Mashonaland, Salisbury (Marshall); Natal (Gooch); Cape Colony, Capetown (Trimen); Madagascar; Bourbon. *Exp.* 34 mill.

(10) Leucania loreyi, Dup. Lép. Fr. iv. p. 81, pl. 105, f. 7 (1821).

,, *curvula*, Wlk. ix. 102 (1856).

Hab. Europe; Ascension Island; West Africa, Congo; Natal, Estcourt (Hutchinson), Durban (Leigh); Persia; Japan; Formosa; India; Ceylon; Australia; U.S.A.; Neotropical region. *Exp.* 34–42 mill.

(11) Leucania apparata, Wllgrn. Œfv. Vet. Akad. Förh. 1875, p. 105.

Hab. Transvaal; Natal, Weenen; Cape Colony, Transkei (Miss F. Barrett). *Exp.* 30–34 mill.

(12) Leucania irrorata, Moore, P.Z.S. 1881, p. 341.
Hab. Mashonaland, Salisbury (Marshall); India, North-west Himalayas, Punjab; Ceylon. *Exp.* 30 mill.

(13) Leucania usta, n. sp.
Head and thorax grey strongly irrorated with dark brown; abdomen whitish or fuscous irrorated with black. Forewing brown tinged with purplish grey and strongly irrorated with black; an indistinct medial series of black points or dentate line; a white streak on terminal part of median nervure emitting a streak on vein 5 and with a black point in lower angle of cell and reddish mark above it; a minutely crenulate postmedial line bent outwards below costa, sometimes reduced to a series of points; a more or less prominent oblique reddish mark from apex; a fine white terminal line. Hindwing white, the veins and termen tinged with brown; a terminal series of points.
Hab. Natal, Weenen, Estcourt (Hutchinson); Cape Colony, Transkei (Miss F. Barrett). *Exp.* 32–40 mill. Type in B.M.

(14) Leucania nigrisparsa, n. sp.
♀. Pale brownish ochreous; palpi and legs irrorated with black; abdomen white slightly tinged with brown and irrorated with fuscous. Forewing sparsely irrorated with brown scales; a white streak on median nervure; a black point in lower angle of cell; the veins of terminal area pale; traces of a curved postmedial series of black points and of a terminal series. Hindwing pure white.
Hab. Cape Colony, Transkei (Miss F. Barrett). *Exp.* 42 mill. Type in B.M.

(15) Leucania nebulosa, n. sp.
♀. Brownish ochreous; head, thorax, and abdomen irrorated with black. Forewing irrorated with black; a whitish streak on median nervure and sometimes a black point in lower angle of cell; traces of an antemedial series of fuscous points; two more distinct curved postmedial series; an oblique fuscous shade below apex; a terminal series of black points. Hindwing yellowish white; the terminal area between veins 5 and 2 irrorated with fuscous with more or less distinct postmedial series of points on those veins and a terminal series.
Hab. British East Africa, Machakos (Crawshay); Cape Colony, Transkei (Miss F. Barrett). *Exp.* 36 mill. Type in B.M.

(16) Leucania atrimacula, n. sp.

♀. Brownish ochreous; head, thorax, and abdomen sparsely irrorated with black. Forewing irrorated with black, a slight white streak on extremity of median nervure; a black point in lower angle of cell and spot beyond the angle with ferruginous tinge above it; an oblique black shade from below apex; postmedial and terminal series of black points. Hindwing white; the terminal area suffused with fuscous from costa to submedian fold; a terminal series of black points.

Hab. Natal (Gooch). *Exp.* 30 mill. Type in B.M.

(17) Leucania tacuna, Feld. Reis. Nov. pl. 90, f. 22 (1874).

,, *substituta*, Wllgrn. Œfv. Vet. Akad. Förh. 1875, p. 105.

Hab. Transvaal; Natal, Estcourt (Hutchinson), Weenen; Cape Colony, Transkei (Miss F. Barrett). *Exp.* 34–38 mill.

(18) Leucania phæa, n. sp.

♂. Head and thorax grey-brown mixed with fuscous; abdomen paler. Forewing grey-brown strongly irrorated with fuscous; a white point at lower angle of cell; a curved crenulate postmedial blackish line strongly bent outwards below costa; a terminal series of black points. Hindwing semihyaline whitish, the veins, costa, and termen tinged with brown; some dark points on termen.

♀. Abdomen and hindwing fuscous brown; the cilia pale brown with a fuscous line through them.

Hab. Natal, Estcourt (Hutchinson); Cape Colony, Transkei (Miss F. Barrett). *Exp.* 36 mill. Type in B.M.

(19) Leucania unipuncta, Haw. Lep. Brit. p. 174 (1803).

Hab. Nearly universally distributed; Natal, coast-belt. *Exp.* 44–50 mill.

(20) Leucania interlata, Wlk. xi. 713 (1857).

Hab. Natal, Estcourt (Hutchinson). *Exp.* 36 mill.

Auctorum.

Leucania internata, Möschl. Verh. Zool. bot. Ges. Wien. xxxiii. p. 291, pl. xvi. f. 3 (1883) ... ... Cape Colony.

Leucania melianoides, Möschl. Verh. Zool. bot. Ges. Wien. xxxiii. p. 291, pl. xvi. f. 4 (1883) ... ... Cape Colony.

Leucania baziyæ, Möschl. Verh. Zool. bot. Ges. Wien. xxxiii. p. 292, pl. xvi. f. 5 (1883) ... ... Cape Colony.

Sub-Family POLIANÆ.

A. Collar forming a raised hood; abdomen with dorsal crests of scales .. .. *Cucullia.*
B. Collar normal.
  a. Abdomen with dorsal crests of scales .. .. *Polia.*
  b. Abdomen without dorsal crests.
    a^1. Fore tibiæ with claw on outer side .. .. *Ectochela.*
    b^1. Fore tibiæ without claw .. .. *Heliophobus.*

Genus CUCULLIA.

Type.

Cucullia, Schrank Faun. Boica, II. 2, p. 157 (1802) ... ... *verbasci.*

A. Forewing with silvery fascia from middle of cell to termen .. *hutchinsoni.*
B. Forewing with golden-yellow fasciæ in and beyond cell and above basal half of vein 1 .. .. *chrysota.*
C. Forewing with whitish fasciæ in and beyond cell and above basal half of vein 1 .. .. *pallidistria.*
D. Forewing without silvery white or golden fasciæ.
  a. Forewing wholly brownish .. .. *brunnea.*
  b. Forewing with the costal area brownish .. .. *extricata.*
  c. Forewing with the costal area grey.
    a^1. Forewing without orbicular and reniform stigmata .. .. *africana.*
    b^1. Forewing with the orbicular stigma represented by four black points, the reniform fairly distinct .. .. *terrensis.*
    c^1. Forewing with the orbicular stigma annulate, the reniform distinct .. .. *consimilis.*

(1) Cucullia hutchinsoni, n. sp.

Head and thorax grey with darker irroration and a slight brown tinge; palpi with some black at base; abdomen whiter with slight dark irroration, the extremity browner, the ventral surface white. Forewing with the costal and inner areas grey-brown with dark irroration; the rest of wing bright rufous with ochreous yellow streaks below base of costa, below the cell, above vein 1, and above vein 6 towards termen; a brilliant silver fascia from middle of cell to near termen attenuate at each end; traces of an oblique waved

postmedial line from vein 5 to 2; a terminal series of points. Hindwing pure white, the veins tinged with brown towards termen.

Ab. 1. Forewing without any rufous tinge ... ... Cape Colony.

Hab. Natal, Estcourt (Hutchinson), Mooi River; Cape Colony, Annshaw (Miss F. Barrett). *Exp.* 42–48 mill. Type in B.M.

(2) Cucullia chrysota, n. sp.

♂. Head and thorax grey with darker irroration and slight brown tinge; palpi with some black at base; abdomen brownish with dark irroration, the ventral surface white. Forewing with the base of costal area grey, the rest brownish with dark irroration; a golden-yellow fascia in and above middle of cell to beyond its extremity with a black point in middle of cell and two towards extremity; rufous fasciæ below basal half of median nervure and in lower end of cell with a golden-yellow streak below the former; the rest of wing grey with dark irroration and fine dark streaks on the veins and in interspaces of terminal area; a terminal series of points. Hindwing white, the veins and termen tinged with brown.

Hab. Natal, Estcourt (Hutchinson), Durban (Innes). *Exp.* 36 mill. Type in B.M.

(3)*Cucullia pallidistria, Feld. Reis. Nov. pl. 108, f. 54 (1874).

Hab. South Africa. *Exp.* 44 mill.

(4) Cucullia brunnea, n. sp.

♂. Head and thorax brown; abdomen pale ochreous brown. Forewing grey-brown slightly suffused with fuscous towards base and costa; a very indistinct antemedial line angled outwards in and below cell and inwards on vein 1; orbicular rounded with ochreous ring and dark outline; reniform with dark outline and discoidal bar; some pale points on costa towards apex; an indistinct minutely dentate subterminal line bent outwards at vein 4 and with more prominent double lunule on it above tornus; a terminal series of blackish points. Hindwing pale tinged with reddish brown and with broad dark terminal band; cilia whitish. Under side of forewing pale brownish.

Hab. Cape Colony, Bedford (M. Weale). *Exp.* 30 mill. Type in Coll. Druce.

(5) Cucullia extricata, Wlk. xi. 630 (1857).

Hab. Natal (Gueinzius); Cape Colony, Annshaw (Miss F. Barrett), Knysna. *Exp.* 44–48 mill.

(6) Cucullia africana, Auriv. Œfv. Ak. Förh. xxxvi. (7) p. 59 (1879).

Cucullia minuta, Möschl. Verh. z. b. Wien. xxxiii. p. 295, pl. xvi. f. 9 (1884).

Hab. German South-west Africa, Damaraland; Cape Colony, Annshaw, Buntingville, Grahamstown (Miss F. Barrett). *Exp.* 42 mill.

(7) Cucullia terrensis, Feld. Reis. Nov. pl. 108, f. 53 (1874).

Hab. Natal, Durban (Leigh); Cape Colony, Capetown (Lightfoot). *Exp.* 46 mill.

(8) Cucullia consimilis, Feld. Reis. Nov. pl. 108, f. 52 (1874).

,, *pusilla*, Möschl. Verh. z. b. Wien. xxxiii. p. 296, pl. xvi. f. 10 (1884).

Hab. Cape Colony, Knysna (Trimen), Annshaw (Miss F. Barrett), Concordia (Alston). *Exp.* 30–38 mill.

Genus POLIA.

Type.

Polia, Ochs. Schmett. Eur. iv. p. 73 (1816) *flavicincta*.

A. Forewing without short black streak on terminal part of vein 2 *scotomista*.
B. Forewing with short black streak on terminal part of vein 2 .. *nigridentata*.

(1) Polia scotomista, n. sp.

♂. Head and thorax grey strongly mixed with black; abdomen brownish with dark irroration above. Forewing grey very strongly irrorated with black-brown; an indistinct waved white subbasal line from costa to vein 1; an indistinct interrupted waved white antemedial line; the orbicular annulate, white; the reniform somewhat indistinct; a dentate whitish postmedial line excurved from below costa to vein 3, then incurved; traces of an irregular dark subterminal line; cilia chequered brown and white. Hindwing pale ochreous suffused with brown; the cilia whitish; under side whitish with fuscous discoidal spot and sinuous postmedial line.

Hab. Natal, coast-belt; Cape Colony, Capetown. *Exp.* 42–48 mill. Type in B.M.

(2) Polia nigridentata, n. sp.

♂. Head and thorax grey-white largely mixed with fuscous and black; tarsi banded with black; abdomen tinged with ochreous and largely suffused with fuscous on dorsum. Forewing white strongly

irrorated with black; a blackish spot below base of cell; an indistinct waved black antemedial line very oblique from costa to vein 2 below end of cell where it is strongly angled, then inwardly oblique; the orbicular and reniform rounded, very indistinct with blackish outlines, the postmedial line indistinct, strongly dentate, excurved from costa to vein 3, then incurved and bent outwards again above inner margin; the subterminal line strongly dentate with three prominent black teeth on a whitish patch below middle; the terminal part of vein 2 streaked with black; a fine crenulate black terminal line. Hindwing fuscous.

Hab. Cape Colony, Transkei (Miss F. Barrett). *Exp.* 44 mill. Type in B.M.

Genus ECTOCHELA, nov.

Proboscis fully developed; palpi with the second joint upturned and fringed with long hair in front, the third porrect, moderate; head and thorax clothed with long rough hair mixed with scales; antennæ of male minutely serrate and ciliated; tibiæ fringed with long hair, the fore tibia with moderate curved claw on outer side; veins 3 and 5 from near angle of cell; 6 from upper angle; 9 from 10 anastomosing with 8 to form the areole; 11 from cell. Hindwing with veins 3, 4 from angle of cell; 5 obsolescent from middle of discocellulars; 6, 7 from upper angle.

Ectochela canina, Feld. Reis. Nov. pl. 100, f. 10 (1874).

Hab. Cape Colony, Calvinia District (Alston). *Exp.* ♂ 38, ♀ 44 mill.

Genus HELIOPHOBUS.

	Type.
Heliophobus, Boisd. Ind. Meth. p. 111 (1840)...	*hispida.*

Sect. I. Antennæ of male bipectinate.

A. Ground colour bright red .. .. *perrubra.*
B. Ground colour olive-brown .. .. *informis.*

(1) Heliophobus perrubra, n. sp.

♀. Antennæ serrate, whitish; head, thorax, and abdomen chestnut-red mixed with whitish scales. Forewing bright chestnut-red; a subbasal black line from costa to submedian fold with pink band on its outer side connected on subcostal and median nervures with

the antemedial pink band, leaving a black point in cell, the antemedial band edged by a black line excurved below costa, then oblique and sinuous; the reniform and orbicular pink edged with white and black lines and connected by a fascia on median nervure; the postmedial line black edged by pink, oblique from costa, strongly excurved beyond cell, then incurved and touching lower edge of reniform; the subterminal line black edged with white, excurved at veins 6 and 3, then incurved, with a pink band on its outer edge with strongly dentate outer edge. Hindwing yellow-brown; the cilia pinkish; the under side with discal spot and curved postmedial line.

Hab. Cape Colony, Transkei (Miss F. Barrett). *Exp.* 34 mill. Type in B.M.

(2) Heliophobus informis, Wlk. x. 402 (1856).

Hab. "Interior of South Africa." *Exp.* 40 mill.

Sect. II. Antennæ of male serrate and fasciculate.

(3) Heliophobus fumea, n. sp.

Fuscous black; pectus, legs, and ventral surface of abdomen with some grey hair. Forewing narrow, irrorated with darker scales; a black antemedial line not quite reaching costa and slightly sinuous and angled in submedian fold; a discoidal point; a minutely waved postmedial line strongly excurved from below costa to vein 3, then strongly incurved; a fine black terminal line. Hindwing fuscous grey.

Hab. Cape Colony, Transkei (Miss F. Barrett). *Exp.* 28 mill. Type in B.M.

Sub-Family CARADRININÆ.

A. Abdomen with dorsal crests of scales.
  a. Prothorax with crest of scales.
    a^1. Frons with rounded prominence.
      a^2. Hindwing with veins 6, 7 stalked .. .. *Mionides.*
      b^2. Hindwing with veins 6, 7 from cell.
        a^3. Palpi upturned, the third joint long porrect .. *Paratuerta.*
        b^3. Palpi porrect .. .. *Tumidifrontia.*
    b^1. Frons without prominence.
      a^2. Patagia with upturned spatulate hairs at extremity *Diphthera.*
      b^2. Patagia normal.
        a^3. Forewing of normal breadth .. .. *Euplexia.*
        b^3. Forewing narrow .. .. *Magusa.*
  b. Prothorax without crest.
    a^1. Metathorax with distinct crest of scales.
      a^2. Fore tibiæ broadly fringed with hair .. .. *Spodoptera.*

b^2. Fore tibiæ normal.
a^3. Forewing with the cilia crenulate .. .. *Prodenia.*
b^3. Forewing with the cilia non-crenulate.
a^4. Forewing without tufts of raised scales .. *Acronycta.*
b^4. Forewing with tufts of raised scales on stigmata .. .. *Bryophila.*
b^1. Metathorax without crest .. .. *Amyna.*
B. Abdomen without dorsal crests.
a. Prothorax with crest of scales.
a^1. Frons with rounded prominence and quadrangular plate below it .. .. *Matopo.*
b^1. Frons without prominence .. .. *Charidea.*
b. Prothorax without crest.
a^1. Metathorax with crest of scales.
a^2. Frons with two corneous plates .. .. *Diparopsis.*
b^2. Frons without plates .. .. *Conservula.*
b^1. Metathorax without crest.
a^2. Frons with conical prominence.
a^3. Palpi upturned.
a^4. Palpi with the third joint long .. .. .. *Svinhœa.*
b^4. Palpi with the third joint short .. .. .. *Ovios.*
b^3. Palpi porrect .. .. *Conicofrontia.*
b^2. Frons without prominence.
a^3. Frons with tuft of hair .. .. *Sesamia.*
b^3. Frons without tuft.
a^4. Forewing with the apex obtuse.
a^5. Palpi smoothly scaled, flattened against frons .. .. *Leocyma.*
b^5. Palpi fringed with scales in front.
a^6. Tarsi with tuft of scales on first joint .. .. *Lophotarsia.*
b^6. Tarsi without tuft of scales on first joint .. .. *Caradrina.*
b^4. Forewing with the apex produced and acute *Acrapex.*

Genus MIONIDES, nov.

Proboscis absent; palpi slight, extending to just beyond the frons and somewhat upturned; frons with rounded prominence; antennæ with fasciculate cilia; pro- and meta-thorax slightly crested; abdomen with dorsal crests. Forewing rather narrow, the apex produced, the termen obliquely rounded; veins 3 and 5 from close to angle of cell; 6 from upper angle; 9 from 10 anastomosing with 8 to form the areole; 11 from cell. Hindwing with veins 3, 4 from angle of cell; 5 obsolescent; 6, 7, stalked.

Mionides lichenea, n. sp.

♂. Head and thorax white strongly irrorated with black; abdomen whitish mixed with fuscous, the dorsal tufts darker.

Forewing white strongly irrorated with black leaving a clearer discal patch; a waved black antemedial line defined by white on inner side; the orbicular a small ocellus, the reniform hardly traceable; a waved black postmedial line strongly excurved from below costa to vein 3, then incurved; some white points on costa towards apex and at base of cilia. Hindwing whitish tinged with fuscous especially on apical area; a bar-shaped blackish discoidal spot showing through from under side; cilia white with dark line at base.

Hab. Natal, Estcourt (Hutchinson). *Exp.* 28 mill.

Genus PARATUERTA, nov.

Proboscis fully developed; palpi obliquely upturned, the second joint clothed with rough hair, the third long porrect, roughly scaled; frons with large truncate conical prominence with small raised rim at extremeity; antennæ of female minutely serrate; tibiæ clothed with long hair; abdomen with dorsal crests. Forewing with veins 3 and 5 from near angle of cell; 6 from upper angle; 9 from 10 anastomosing with 8 to form the areole; 11 from cell. Hindwing with veins 3, 6 from angle of cell; 5 obsolescent from middle of discocellulars; 6, 7 from upper angle.

Paratuerta marshalli, n. sp.

♀. Head and thorax chocolate and black-brown irrorated with grey-white; pectus orange; abdomen orange dorsally tinged with black and with the dorsal crests chocolate. Forewing fuscous grey strongly irrorated with white, the area above the white markings and curved line suffused with olive-green; a pure white fascia below the cell, constricted at middle where its lower edge is indented by a black-edged sinus, ending in a point followed by two white spots met by a curved line from costa; an indistinct curved subterminal line angled inwards in submedian fold and outwards on vein 1. Hindwing orange with black terminal band with slightly dentate inner edge. Under side of forewing orange with blackish point in cell, discoidal lunule and terminal band.

Hab. Mashonaland, Salisbury (Marshall). *Exp.* 50 mill. Type in B.M.

Genus TUMIDIFRONTIA, nov.

Proboscis absent; palpi short porrect; frons with large rounded prominence somewhat hollowed out at apex; antennæ with short

uniseriate laminate branches; pro- and meta-thorax with large crests; tibiæ fringed with long hair; abdomen with large dorsal crest on first segment. Forewing with veins 3 and 5 from near angle of cell; 6 from upper angle; 9 from 10 anastomosing with 8 to form the areole; 11 free; cilia non-crenulate. Hindwing with veins 3, 4 from angle of cell; 5 obsolescent; 6, 7 from upper angle.

Tumidifrontia castaneotincta, n. sp.

♂. Head and thorax grey and ferruginous red; abdomen silky ferruginous. Forewing with the basal area pale ferruginous red, its outer edge oblique with the fine oblique antemedial line just beyond it; the medial area grey, the orbicular and reniform rather small and indistinct with ferruginous outlines and some ferruginous suffusion above them on costa; the postmedial line indistinct, nearly straight from costa to vein 3, then strongly incurved and bent outwards again to inner margin, with black suffusion beyond it between vein 2 and inner margin; the terminal area grey-brown with fine dark terminal line. Hindwing whitish with slight pinkish discoidal spot and some brown irroration on termen.

Hab. Mashonaland, Salisbury (Marshall). *Exp.* 30 mill. Type in B.M.

Genus DIPHTHERA.

	Type.
Diphthera, Ochs. Eur. Schmett. iv. p. 63 (1816)	*orion.*

*Diphthera verbenata, Dist. A.M.N.H. (7) 1, p. 222 (1898).

Hab. Transvaal, Barberton (Kendall). *Exp.* 32 mill.

Genus EUPLEXIA.

	Type.
Euplexia, Steph. Ill. Brit. Ent. Haust. iii. p. 3 (1829)	*lucipara.*

A. Forewing with black streaks from base below the cell and vein 1 *intermedia.*
B. Forewing with black streak from base below the cell .. .. *melanoleuca.*
C. Forewing without black streaks below the cell or vein 1.
  a. Forewing with large black basal patch defined by white on medial area, and black patch at tornus defined by white on inner side .. .. *melanobasis.*
  b. Forewing without black patches defined by white.
    a^1. Forewing with narrow bluish white band from beyond the reniform to inner margin .. .. *saldanha.*

b^1. Forewing with broad ochreous white band from beyond the reniform to inner margin .. .. *augens.*
c^1. Forewing without whitish band from beyond the reniform to inner margin.
a^2. Forewing with pale patch from the reniform to apex *amaranta.*
b^2. Forewing without pale patch beyond the reniform.
a^3. Forewing with the lines and stigmata defined by greenish orange scales .. .. *lucia.*
b^3. Forewing without greenish orange scales on the lines.
a^4. Forewing with pinkish suffusion beyond the postmedial line .. .. *algoa.*
b^4. Forewing without pinkish suffusion beyond the postmedial line.
a^5. Forewing with the veins not streaked with white.
a^6. Forewing without series of pale points beyond the postmedial line.
a^7. Forewing without white spots on the reniform and points round it.
a^8. Forewing with subterminal series of dentate spots .. .. *consummata.*
b^8. Forewing without subterminal series of dentate spots.
a^9. Forewing with the postmedial line angled beyond the cell .. .. *exsiccata.*
b^9. Forewing with the postmedial line curved beyond the cell .. .. *ambigua.*
b^7 Forewing with white spots on the reniform and points round it .. *africana.*
b^6. Forewing with series of pale points beyond the postmedial line .. .. .. *capensis.*
b^5. Forewing with all the veins streaked with white .. .. *ruptilinea.*

(1) Euplexia intermedia, Brem. Lep. Ost. Sib. p. 53 (1864).
Auchmis sikkimensis, Moore, P.Z.S. 1867, p. 169, pl. 6, f. 15.
Hab. Natal, Victoria District (Gooch); Amurland; Japan; India; Ceylon. *Exp.* 34–38 mill.

(2)*Euplexia melanoleuca, n. sp.

♀. Head and thorax white slightly tinged with brown; palpi black at sides, the extremities of second and third joints white; frons at sides, antennæ, tips of tegulæ and two patches on each patagium black; tarsi ringed with black; abdomen white, the dorsal crests black, lateral patches and dorsal and ventral patches on anal segment black. Forewing white, the basal, costal, and postmedial areas suffused with smoky brown; a short black streak below base

of cell; a striga from costa close to base and a waved subbasal line from costa to submedian fold; an antemedial black line incurved and obsolescent in cell and angled inwards on vein 1; orbicular pale brown, elliptical, erect; the medial shade black, oblique from costa to median nervure, then incurved and ending in a spot above vein 1; reniform smoky brown defined by black, very large and round; the postmedial line minutely waved, bent outwards below costa, excurved to vein 3, then incurved, with some white on its outer edge towards inner margin and two black lunules before it above veins 5 and 6; three white points on postmedial part of costa; a curved minutely dentate indistinct subterminal line; a subapical black patch with a white spot on its inner edge; a K-like terminal mark on vein 5 and a lunule and patch on cilia below vein 2; a series of small terminal lunules. Hindwing white suffused with fuscous except towards termen; a fuscous postmedial line angled inwards in discal and submedian folds; the tornus white with a black spot and patch on cilia below vein 2 and a lunule at tornus; a terminal waved line defined by white on inner side; cilia white; the under side with black discoidal spot, curved postmedial line and black patches on cilia at apex and below vein 2.

Hab. Natal. *Exp.* 50 mill. Type in Coll. Druce.

(3) Euplexia melanobasis, n. sp.

♀. Head white; palpi except third joint and antennæ black; tegulæ ferruginous brown; thorax and patagia white with black spots at base of patagia and patches on metathorax; pectus and legs black and white; abdomen white irrorated with black and with dorsal black bands. Forewing with the basal area black extending to near one-half of wing down to submedian fold, below that to one-third, a white and olive-brown mark at base of costa; medial area broadly suffused with white; the reniform black with a white mark on it and rather quadrate in shape, some blackish marks on costa above it; terminal area fuscous with a quadrate black patch on costa before apex; a spot on vein 5 and a large patch at tornus defined by white on inner side. Hindwing fuscous black; cilia of both wings chequered black and white.

Hab. Natal, Mooi River. *Exp.* 34 mill. Type in B.M.

(4) Euplexia saldanha, Feld. Reis. Nov. pl. 110, f. 6 (1874).

Hab. Transvaal, Johannesburg (Distant); Natal, Estcourt (Hutchinson); Cape Colony, Knysna. *Exp.* 36 mill.

(5) Euplexia augens, Feld. Reis. Nov. pl. 110, f. 5 (1874).
Hab. Cape Colony, Knysna, Capetown. *Exp.* 34 mill.

(6) Euplexia amaranta, Feld. Reis. Nov. pl. 110, f. 8 (1874).
Hab. Natal, Durban (Burrows). *Exp.* 36 mill.

(7) Euplexia lucia, Feld. Reis. Nov. pl. 109, f. 16 (1874).
Hab. British East Africa, Uganda Railway; Mashonaland, Salisbury (Marshall); Cape Colony, Knysna (Trimen), Transkei (Miss F. Barrett). *Exp.* 44–46 mill.

(8) Euplexia algoa, Feld. Reis. Nov. pl. 102, f. 21 (1874).
Hab. Natal, Durban (Bowker); Cape Colony, Knysna. *Exp.* 30 mill.

(9) Euplexia consummata, Wlk. xi. 591 (1857).
Hadena confundens, Wlk. xi. 757 (1857).
Mamestra thoracica, Wlk. xv. 1684 (1858).
Xylina breviuscula, Wlk. xv. 1735 (1858).
Apamea connivens, Feld. Reis. Nov. pl. 109, f. 27 (1874).
Hab. Natal (Gueinzius), Estcourt (Hutchinson); Cape Colony, Transkei (Miss F. Barrett); India. *Exp.* 36 mill.

(10) Euplexia exsiccata, Wllgrn. Wien. Ent. Mon. iv. p. 169 (1860).
Hadena instructa, Wlk. xxxiii. 733 (1865).
,, *rubrescens*, Wlk. xxxiii. 733 (1865).
Hab. Cape Colony (Trimen), Transkei (Miss F. Barrett). *Exp.* 34 mill.

(11) Euplexia ambigua, Wlk. xv. 1727 (1858).
Hab. Natal (Gueinzius). *Exp.* 26 mill.

(12) Euplexia africana, Schaus and Clem. Lep. Sierra Leone, p. 33, pl. 2, f. 10 (1893).
Hab. West Africa, Sierra Leone; Natal, Victoria District (Gooch). *Exp.* 36 mill.

(13) Euplexia capensis, Guen. Noct. 1, p. 213 (1852).
Perigea sutor, Guen. Noct. 1, p. 231 (1852).
Caradrina conducta, Wlk. x. 296 (1856).
Hadena pauperata, Wlk. xv. 1727 (1858).
Perigea inexacta, Wlk. xxxii. 682 (1865).

Hab. Neotropical region; West Africa; Aden; Sokotra; British East Africa; Mashonaland, Salisbury (Marshall); Natal, Estcourt (Hutchinson); China; India, Ceylon, and Burma; Andamans; Java; Fiji. *Exp.* 36–38 mill.

(14) Euplexia ruptilinea, Wlk. xi. 507 (1857).
Hab. Natal (Gueinzius). *Exp.* 34 mill.

Auctorum.

Amphia subunita, Guen. Noct. 1, p. 224 (1852) ... ... Cape Colony.
Hadena fusifasciata, Wlk. xxxiii. 731 (1865). Type lost ... ... South Africa.
Hadena mamestroides, Wlk. xxxiii. 732 (1865). Type lost ... ... South Africa.

Genus MAGUSA.

Type.
Magusa, Wlk. xi. 762 (1857) ... ... *strigifera*.

Magusa tenebrosa, Moore, P.Z.S. 1867, p. 59. Hmpsn. Moths Ind. ii. p. 226.
Hab. Cape Colony, Transkei (Miss F. Barrett); Madagascar; India; Ceylon. *Exp.* 36–42 mill.

Genus SPODOPTERA.

Type.
Spodoptera, Guen. Noct. i. p. 153 (1852) ... ... *mauritia*.

Sect. I. Palpi with the third joint long and porrect.

(1) Spodoptera adela, n. sp.
♂. Head and thorax pale reddish brown mixed with grey and black; palpi blackish at sides, tegulæ with black medial line; pectus and legs white, the latter irrorated with pink and black, the tarsi ringed with black; abdomen whitish tinged with brown and irrorated with black. Forewing grey suffused with brown; subbasal and antemedial lines double, black filled in with grey, the former interrupted and angled in cell, the latter waved, angled outwards below costa and more strongly in submedian fold and above inner margin and inwards on vein 1; claviform large, conjoined to the orbicular and

defined by black; orbicular and reniform with grey annulus defined by black; the postmedial line black defined by grey on outer side, minutely dentate, bent outwards below costa and oblique below vein 3; an indistinct sinuous subterminal line and greyish apical patch. Hindwing semihyaline white, the veins and apical area to vein 2 fuscous brown.

Hab. N'Gamiland (Lugard). *Exp.* 30 mill. Type in B.M.

Sect. II. Palpi with the third joint short and upturned.

(2) Spodoptera mauritia, Boisd. Faun. Ent. Madag. Lep. p. 92 (1833).

Hab. West Africa; Aden; Sokotra; Mashonaland, Salisbury (Marshall); Natal (Gooch, Wilkinson); Durban (Leigh); Cape Colony, Grahamstown, Annshaw (Miss F. Barrett); Mauritius; throughout the Oriental and Australian regions. *Exp.* 34–44 mill.

Genus PRODENIA.

	Type.
Prodenia, Guen. Noct. i. p. 159 (1852)	*littoralis.*

A. Forewing with the lines pale .. .. *littoralis.*
B. Forewing with the lines dark .. .. *leucophlebia.*

(1) Prodenia littoralis, Boisd. Faun. Ent. Madag. Lep. p. 91, pl. 13, f. 8 (1833). Moore, Lep. Ceyl. iii. pl. 146, f. 1, a. b. (larva).

Hab. Mediterranean subregion and throughout the tropical and subtropical zones of the Old World; Mashonaland, Salisbury (Marshall); Natal, Malvern (Marshall), Durban (Leigh). *Exp.* 30–45 mill.

(2) Prodenia leucophlebia, n. sp.

♂. Head and thorax dark brown and black; abdomen whitish slightly tinged with fuscous, the ventral surface fuscous, the anal tuft ochreous. Forewing black suffused with leaden grey; an indistinct antemedial leaden-grey line bent outwards below costa and excurved below cell; the orbicular ochreous white, oblique; the reniform leaden grey with ochreous white edge; the claviform black; the median nervure beyond the antemedial line, vein 2 to the postmedial line streaked with ochreous white and the bases of veins 3–4 with pure white; the postmedial line black, minutely waved, sinuous,

and incurved below vein 3; a subterminal series of dentate black spots with ochreous points on their inner edge; a terminal series of black points. Hindwing pure white, the costal area and a fine terminal line or series of points on apical half fuscous.

Hab. Natal, Karkloof (Marshall). *Exp.* 34 mill. Type in B.M.

Genus ACRONYCTA.

	Type.
Acronicta, Ochs. Eur. Schmett. iv. p. 62 (1816)	*leporina.*

A. Forewing with the subterminal line strongly angled inwards in submedian fold .. .. *externa.*
B. Forewing with the postmedial line not angled inwards in submedian fold .. .. *paragrapha.*

(1) Acronycta externa, Wlk. xi. 756 (1857).

Hab. Cape Colony, Annshaw (Miss F. Barrett). *Exp.* 34 mill.

(2) Acronycta paragrapha, Feld. Reis. Nov. pl. 100, f. 8 (1874).

Hab. Madagascar; Cape Colony, Knysna. *Exp.* 44 mill.

Genus BRYOPHILA.

	Type.
Bryophila, Treitschke, Eur. Schmett. v. pl. 1, p. 57 (1825)	*muralis.*
Iambia, Wlk. xxvii. 109 (1863)	*inferalis.*

A. Forewing with the ground colour green.. .. .. *melanochlora.*
B. Forewing with the ground colour pale grey-brown .. .. .. *indecora.*
C. Forewing with the ground colour blackish .. .. *inferalis.*
D. Forewing with the ground colour white .. .. *melanoleuca.*

(1) Bryophila melanochlora, n. sp.

♂. Head and thorax sap-green; palpi banded black and white; antennæ brown; tegulæ at sides and patagia with black stripes; pectus and legs white irrorated with brown, the tibiæ and tarsi banded with red and black; abdomen brown, the ventral surface white irrorated with brown. Forewing sap-green irrorated with black scales; a black fascia from base of costa to the postmedial line interrupted in places; some black strigæ from costa; an obscure strongly waved double antemedial line; the orbicular and reniform hardly traceable; the postmedial line double, strongly bent outwards below costa, curved to vein 4, then incurved and its inner line deep

black and minutely dentate; an oblique black shade from apex and a fascia above vein 4 from postmedial line to termen; a terminal series of black points. Hindwing black-brown; cilia pale at base and below middle. Under side of both wings with some dark red on costal area; hindwing with discoidal spot and highly dentate postmedial line.

Hab. Natal, Karkloof (Marshall), Durban (G. F. Leigh). *Exp.* 34 mill. Type in B.M.

(2)*Bryophila indecora, Feld. Reis. Nov. pl. 110, f. 1 (1874).

Hab. Cape Colony, Cape Town. *Exp.* 30 mill.

(3) Bryophila inferalis, Wlk. xxvii. 109 (1863).

Hab. Natal, Durban (Gueinzius, Gooch). *Exp.* 32 mill.

(4) Bryophila melanoleuca, n. sp.

♀. Head and thorax white; palpi except at extremity, sides of frons, and the tips of patagia and metathoracic crest black; legs black and white; abdomen irrorated with brown scales, the ventral surface with black patch before extremity. Forewing white, the base of costa and inner margin black with fulvous spots below costa and cell; an antemedial black band, its inner edge angled outwards in cell, its outer slightly in cell and strongly below the cell; three black spots on medial part of costa, the middle one larger, quadrate; a black annulus in end of cell with discoidal bar beyond it; a diffused band of fulvous scales from lower angle of cell to inner margin; an oblique black band from costa before apex to vein 6 with a large diffused fuscous patch between it and an oblique black band from vein 2 to tornus; some fuscous marks on termen and a terminal series of black striæ; cilia intersected with black. Hindwing white suffused with black except towards base; the cilia white; the under side white irrorated with black with sinuous postmedial line and traces of subterminal line.

Hab. Natal, Durban (Leigh). *Exp.* 26 mill. Type in B.M.

Genus AMYNA.

	Type.
Amyna, Guen. Noct. i. p. 406 (1852)	*selenampha.*
Ilattia, Wlk. xvi. 208 (1858)	*octo.*

Sect. I. (*Ilattia*). Forewing of male with a fovea in cell covered on under side by a scale fan.

(1) Amyna octo, Guen. Noct. i. p. 233 (1852).
Perigea vexabilis, Wllgrn. Wien. Ent. Mon. vii. p. 148 (1863).
Erastria bavia, Feld. Reis. Nov. pl. 108, f. 37 (1874).
Amyna undulifera, Bull. A.M.N.H. (4) xvi. p. 403 (1875).
Hab. Neotropical region; West Africa; British East Africa; Mashonaland, Salisbury (Marshall); Natal (Burrows); Cape Colony; Aden; Japan; China; India, Ceylon, and Burma; Andamans; Borneo; Christmas Island; Pacific groups. *Exp.* 20–30 mill.

Sect. II. (*Amyna*). Forewing without fovea and scale-fan in cell.

(2) Amyna selenampha, Guen. Noct. i. p. 406 (1852).
Hama latipennis, Wllgrn. Wien. Ent. Mon. iv. p. 169 (1860).
Perigea trivenifica, Wllgrn. Wien. Ent. Mon. vii. p. 148 (1863).
,, *urba*, Wllgrn. Wien. Ent. Mon. vii. p. 148 (1863).
,, *natalensis*, Wllgrn. Svensk. Vet. Akad. Handl. v. 4, p. 55 (1866).
Hab. Sokotra; Mashonaland, Salisbury (Marshall); Damaraland; Transvaal (Ross); Natal, Karkloof (Marshall), Durban (Leigh); Cape Colony, Caffraria; Madagascar; China; India; Ceylon; Andamans; Borneo; Java; Christmas Island. *Exp.* 30–36 mill.

Genus MATOPO.

	Type.
Matopo, Dist. A.M.N.H. (7) i. p. 227 (1898)... ...	*typica.*

A. Forewing with elongate, black-edged claviform stigma .. .. *typica.*
B. Forewing without claviform stigma .. .. *nigrivittata.*

(1) Matopo typica, Dist. A.M.N.H. (7) i. p. 227 (1898).
Hab. Transvaal, Pretoria (Distant); Cape Colony, Annshaw, Transkei (Miss F. Barrett). *Exp.* 38 mill.

(2) Matopo nigrivittata, n. sp.
♂. Head and thorax grey, brown, and black; abdomen grey and brown above, black below. Forewing pale brown, the costal area fuscous irrorated with grey scales; the veins black irrorated with white; orbicular small, whitish, defined by black with a white point beyond it on median nervure; a whitish streak in discal fold from orbicular to termen dividing in two the white reniform, and with a wedge-shaped black patch below it between veins 5 and 2 from the

orbicular to termen; some white marks on termen; ciliæ black intersected with white. Hindwing fuscous, the inner area paler.

Hab. Mashonaland, Salisbury (Marshall). *Exp.* 30 mill. Type in B.M.

Genus CHARIDEA.

Type.

Charidea, Guen. Noct. ii. p. 60 (1852) ... *elegantissima.*

Sect. I. Antennæ of male bipectinate with branches of moderate length.

(1) Charidea elegantissima, Guen. Noct. ii. p. 61 (1852).
Dianthœcia botonga, Feld. Reis. Nov. pl. 109, f. 28 (1874).
Hab. Portuguese East Africa; Cape Colony, Cape Town. *Exp.* 38 mill.

Sect. II. Antennæ of male with very short branches.

A. Forewing purplish red .. .. *vinosa.*
B. Forewing with the inner half blackish, the costal half ochreous .. .. *divisa.*

(2) Charidea vinosa, n. sp.

♂. Head and thorax purple-red; tarsi brown with pale rings; abdomen yellowish white, the ventral surface tinged with purple-red. Forewing purplish red, irrorated with white scales; the orbicular and reniform ochreous surrounded by white points; a double curved postmedial series of white points and a series just before termen. Hindwing yellowish white; the cilia at apex tinged with pink.

Hab. Mashonaland, Salisbury (Marshall). *Exp.* 26 mill. Type in B.M.

(3) Charidea divisa, n. sp.

Head and thorax fuscous black; abdomen whitish tinged with fuscous. Forewing with the inner half fuscous black, the costal half ochreous tinged with rufous towards costa and with fuscous towards apex; the veins of costal area dark; the claviform very elongate defined by a fine black line; fine white and black streaks in the cell; the orbicular obsolete; the reniform small, hardly visible on the ochreous area, brownish with white outline on the black area; the interspaces of terminal area with white and black streaks. Hindwing pale brownish tinged with fuscous.

Hab. Natal, Victoria District (Gooch); Cape Colony, Transkei (Miss F. Barrett). *Exp.* 36 mill. Type in B.M.

Sect. III. Antennæ of male minutely serrate and fasciculate.

A. Forewing ochreous, the area towards tornus bluish grey .. .. *cauta.*
B. Forewing bluish grey suffused with brown.
a. Forewing with oblique reniform conjoined to the grey costal area .. .. *leucosoma.*
b. Forewing with white discoidal point on an elongate black patch *leucopis.*

(4) Charidea cauta, n. sp.

Head and tegulæ reddish, palpi, frons, and legs tinged with fuscous; thorax pale ochreous, the tufts mixed with black; abdomen ochreous white, the ventral surface tinged with rufous. Forewing pale ochreous; the costal area tinged with white, pinkish, and brown; the veins irrorated with dark scales; the reniform represented by a white spot at lower angle of cell; the area towards tornus bluish grey, its upper edge running obliquely from below apex to lower angle of cell; vein 4 defined by white streaks and with bright rufous streaks above it on the grey area. Hindwing yellowish white, tinged with brown towards termen and costa; in female largely tinged with fuscous.

Hab. West Africa, Nigeria; Mashonaland, Salisbury (Marshall); Natal, Malvern (Marshall), Durban (Bowker); Cape Colony, Annshaw (Miss F. Barrett). *Exp.* 30 mill. Type in B.M.

(5) Charidea leucosoma, Feld. Reis. Nov. pl. 109, f. 31 (1874).
Dargida graminicolens, Bull. A.M.N.H (5) ii. p. 295 (1878)
Hab. Madagascar; Natal, Mooi River. *Exp.* 34 mill.

(6) Charidea leucopis, n. sp.

♀. Head and thorax grey-brown; abdomen grey strongly irrorated with brown. Forewing bluish grey strongly tinged with brown; some black points on costa and some pale points towards apex; a black streak from base in submedian fold to the indistinct pale sinuous antemedial line; the claviform black with a fine streak from its outer edge; a slight black streak in middle of cell; an elongate black mark in and beyond end of cell with a pure white discoidal spot on it; the postmedial line very indistinct, dark, minutely dentate, bent outwards below costa, excurved to vein 3, then incurved; an indistinct irregularly waved subterminal line; a terminal series of black points. Hindwing brownish with whitish streaks in and below cell; the under side with discoidal black point.

Hab. Cape Colony, Transkei (Miss F. Barrett). *Exp.* 34 mill. Type in B.M.

Auctorum.

Gortyna trinota, Herr Schäff. Lep. Exot. f. 126 ... ... South Africa.

Genus DIPAROPSIS, nov.

Proboscis moderately developed; palpi upturned, slender, the second joint reaching vertex of head and slightly fringed with hair in front, the third long; frons with corneous plate with rounded outer edge below it, and another with rather pointed outer edge at middle; antennæ of female bipectinate to apex with short branches; patagia very roughly scaled; metathorax with crest; tibiæ somewhat hairy; abdomen without crests. Forewing with the apex rectangular, the termen evenly rounded; veins 3 and 5 from near angle of cell; 6 from upper angle; 9 from 10 anastomosing with 8 to form the areole; 11 from cell.

*Diparopsis castanea, n. sp.

♀. Head and thorax pale reddish chestnut, the rough scales of patagia and metathoracic crest dark brown; abdomen ochreous white. Forewing pale reddish chestnut, with a wedge-shaped dark brown patch between the cell and vein 1 before the indistinct antemedial line which is oblique from costa to below cell; indistinct fine medial and postmedial lines excurved from costa to middle, then incurved, the latter greyish and with reddish brown suffusion between it and the similar subterminal line; cilia red-brown whitish at tips. Hindwing white tinged with ochreous especially towards termen. Under side whitish, forewing suffused with pale rufous especially towards termen.

Hab. Delagoa Bay (Mrs. Monteiro). *Exp.* 30 mill. Type in Coll. Druce.

Genus CONSERVULA.

Type.

Conservula, Grote Bull. Buff. Soc. ii. p. 17 (1874) ... ... *anodonta.*

A. Forewing with the ground colour pinkish .. .. *minor.*
B. Forewing with the ground colour bluish grey .. .. *pulcherrima.*

(1) Conservula minor, Holl. P.U.S. Mus. xviii. p. 253, pl. viii., f. 1 (1896).

Hab. East Africa; Cape Colony. *Exp.* 40 mill.

(2) Conservula pulcherrima, n. sp.

♂. Head and thorax bright rufous pencilled with ochreous; palpi white below; outer part of patagia and part of metathorax blue-grey; pectus and legs mostly white; abdomen fuscous above, white beneath, the anal tuft brownish. Forewing blue-grey; the area from base to reniform and down to vein 1 ochreous strongly irrorated with ferruginous; some whitish spots near base; a double waved ferruginous antemedial line bent outwards and single below vein 1; orbicular and reniform with whitish spots on their edges; a curved ferruginous medial line; traces of a sinuous fuscous postmedial line; a small ochreous and ferruginous patch on costa beyond the medial line and a large patch towards apex traversed by a ferruginous line and with white spots on its outer edge; the subterminal line represented by some dark red points. Hindwing semihyaline white tinged with fuscous at apex.

Hab. Mashonaland, Salisbury (Marshall). *Exp.* 40 mill. Type in B.M.

Genus SVINHŒA.

Type.

Swinhœa, Hmpsn. Moths Ind. ii. p. 324 (1894) *vegeta.*

Svinhoea vegeta, Swinh. P.Z.S., 1885, p. 475, pl. 28, f. 14.

Hab. Abyssinia; N'Gamiland (Lugard); Mashonaland, Salisbury (Marshall); India, Ceylon, and Burma; New Guinea. *Exp.* 22–30 mill.

Genus OVIOS.

Type.

Ovios, Wlk. iii. 753 (1855) ... ... *capensis.*

Sect. I. Antennæ of male bipectinate with short branches; the frontal prominence short.

(1) Ovios capensis, Herr Schäff. Aussereur Schmett. ff. 115–116 (1853).

Hab. Natal, Karkloof (Marshall); Cape Colony, Grahamstown. *Exp.* 32 mill.

Sect. II. Antennæ of male minutely serrate and ciliated; the frontal prominence long.

(2) Ovios alba, Roths. Nov. Zool. iv. p. 183 (1897).

Hab. British Central Africa, Fort Johnson; Tropical South Africa (Eriksson). *Exp.* 48 mill.

Genus CONICOFRONTIA, nov.

Proboscis aborted, minute; palpi porrect to just beyond the frons and fringed with long hair below; frons with conical prominence; antennæ of female ciliated; thorax and abdomen without crests. Forewing with veins 3 and 5 from near angle of cell; 6 from just below upper angle; 9 from 10 anastomosing with 8 to form the areole. Hindwing with veins 3, 4 from angle of cell; 5 obsolescent; 6, 7 from upper angle.

Conicofrontia sesamoides, n. sp.

♀. Head and thorax ochreous grey mixed with brown; abdomen whitish with obscure fuscous bands. Forewing ochreous grey strongly irrorated with black; short subterminal black striæ above veins 4, 5 with traces of others above and below them. Hindwing whitish suffused with fuscous.

Hab. Cape Colony, Transkei (Miss F. Barrett). *Exp.* 38 mill. Type in B.M.

Genus SESAMIA.

	Type.
Sesamia, Guen. Noct. i. p. 95 (1852)	*vuteria.*

Sect. I. Antennæ of male bipectinate with short branches.

A. Forewing fuscous.
  a. Forewing with ante- and post-medial lines .. .. *fusca.*
  b. Forewing without transverse lines .. .. *albipuncta.*
B. Forewing ochreous, without lines.
  a. Forewing tinged with rufous, the veins pale .. .. *vuteria.*
  b. Forewing ochreous white irrorated with black .. .. *coniota.*

(1) Sesamia fusca, n. sp.

Head and thorax black-brown; abdomen ochreous dorsally tinged with black; tarsi with pale rings. Forewing brown strongly tinged with black; traces of a black antemedial line angled outwards below cell; orbicular and reniform indistinct with black outlines; a minutely crenulate postmedial line excurved from costa to vein 3, then oblique; an oblique subterminal series of dentate black spots with more or less prominent ochreous line on their outer edge; a terminal series of black points. Hindwing ochreous more or less completely suffused with fuscous; a slight discoidal lunule and traces of a curved post-medial series of dark points.

Hab. Cape Colony, Annshaw (Miss F. Barrett). *Exp.* ♂ 36, ♀ 40 mill. Type in B.M.

(2) Sesamia albipuncta, n. sp.

♂. Fuscous brown; vertex of head rather pale; palpi black at sides; pectus, streaks on legs and ventral surface of abdomen blackish. Forewing with white discoidal point. Hindwing somewhat paler brown.

Hab. Cape Colony, Transkei (Miss F. Barrett). *Exp.* 30 mill. Type in B.M.

(3) Sesamia vuteria, Stoll. Suppl. Cram. Pap. Exot. pl. 36, f. 5 (1783).

Cossus nonagrioides, Lef. Ann. S. Linn. Paris, 1827, p. 98, pl. 5.

Leucania incerta, Wlk. ix. 103 (1856).

,, *inferens*, Wlk. ix. 105 (1856).

,, *proscripta*, Wlk. ix. 106 (1856).

Nonagria intestata, Wlk. ix. 130 (1856).

Sesamia fraterna, Moore, Lep. Alk. p. 103 (1879).

Hab. Southern Europe; Japan; India, Ceylon, and Burma; Borneo; Mashonaland, Salisbury (Marshall); Natal (Gooch); Cape Colony (Dr. A. Smith). *Exp.* 32–38 mill.

(4) Sesamia coniota, n. sp.

Ochreous white. Forewing irrorated with black scales aggregated to form points below middle of cell, base of vein 2 and beyond the cell in discal fold.

Hab. Mashonaland, Salisbury (Marshall). *Exp.* 20–22 mill. Type in B.M.

Sect. II. Antennæ of male ciliated.

A. Forewing with the ground colour pink or pinkish.
   a. Forewing without black point in lower angle of cell .. .. .. *tæniolenca.*
   b. Forewing with black point in lower angle of cell .. .. .. *albivena.*
B. Forewing with the ground colour ochreous.
   a. Forewing with terminal series of black points .. .. *epunctifera.*
   b. Forewing without terminal series of points .. .. *flavescens.*

(5) Sesamia tæniolenca, Wllgrn. Svensk. Akad. Handl. v. 4, p. 58 (1866).

Hab. Mashonaland, Salisbury (Marshall); Damaraland, Kuisip. *Exp.* 34 mill.

(6) Sesamia albivena, n. sp.

Head and thorax ochreous white, the thorax tinged with pink; palpi and forelegs fuscous; abdomen white. Forewing pale flesh pink; the veins whitish; a fuscous streak along median nervure from

near base to near termen; a black point in lower angle of cell; some specimens with traces of a black point below the cell before middle, and of a curved subterminal series; cilia with pale line at base, then pinkish with three brown lines through them. Hindwing white tinged with brownish, ochreous towards costa and termen.

Hab. Mashonaland, Salisbury (Marshall); Natal, Estcourt (Hutchinson). *Exp.* 30–34 mill.

(7) Sesamia epunctifera, n. sp.

♂. Ochreous; palpi blackish; head and thorax mixed with brown; abdomen whitish tinged with fuscous. Forewing thickly irrorated with black and tinged with brown especially on terminal area; the veins whitish; a black point beyond the cell above vein 5; a terminal series of black points. Hindwing white tinged with ochreous towards termen.

♀. Abdomen whiter; forewing slightly irrorated with black; an antemedial black point below the cell and traces of a curved postmedial series of points from vein 5 to submedian fold.

Hab. British East Africa, Athi-ya-Mawe (Betton); Cape Colony, Annshaw (Miss F. Barrett). *Exp.* 24 mill. Type in B.M.

(8) Sesamia flavescens, n. sp.

♀. Head, thorax, and abdomen ochreous white; palpi and legs brownish. Forewing pale yellow, slightly tinged with pink towards costa; the median nervure, the veins rising from it and vein 1 white with some fuscous scales, the former with slight fuscous suffusion towards and beyond end of cell. Hindwing ochreous white tinged with fuscous.

Hab. Cape Colony, Annshaw (Miss F. Barrett). *Exp.* 26 mill. Type in B.M.

Auctorum.

Simyra capillata, Wllgrn. Œfv. Vet. Akad. Förh. 1875, p. 104 ... ... Transvaal.

Genus LEOCYMA.

Type.

Leocyma, Guen. Noct. ii. p. 212 (1852) ... ... *tibialis.*

Leocyma tibialis, Fabr. Syst. Ent. p. 578 (1775).

Hab. Mashonaland, Umcheke Road (Marshall); Natal, Durban (Leigh); India; Formosa; New Ireland; Tahiti; Tonga. *Exp.* 36–44 mill.

Genus LOPHOTARSIA, nov.

Proboscis fully developed; palpi obliquely upturned to just beyond the frons which is rounded; antennæ of male nearly simple; thorax and abdomen without crests; tibiæ and first joint of tarsi with tufts of rough scales on upper side; anal segment of abdomen long. Forewing very narrow, the termen short, rounded; vein 3 from well before angle of cell; 4, 5 from angle; 6 from below upper angle; 7, 8, 9, 10 stalked; 11 free. Hindwing with veins 3, 4 stalked; 5 obsolescent from just below angle of discocellulars; 6, 7 stalked; 8 arising free, then anastomosing with cell to middle.

Lophotarsia ochroprocta, n. sp.

♂. Head ochreous and red-brown; tegulæ ochreous and red-brown at base, then with deep brown band and the tips grey; thorax grey with ochreous scales on metathorax; pectus ochreous; fore coxæ rufous, the legs grey with the first joint of tarsi black; abdomen ochreous, dorsally blackish except anal segment, which has lateral blackish streaks, the first two segments with ventral rufous stripe. Forewing grey, the costal area tinged with ochreous; a cupreous reddish tinge along vein 1 and as an ill-defined postmedial band; some black on inner margin near base and a subbasal black line; some black marks on costa and a few scales below middle of cell; the reniform defined by black; some black scales forming traces of a postmedial line with slight streaks on the veins beyond it. Hindwing semihyaline white, the costal area irrorated with black; some black points on termen towards apex.

Hab. Natal, Estcourt (Hutchinson). *Exp.* 34 mill. Type in B.M.

Genus CARADRINA.

Type.

Caradrina, Ochs. Schmett. Eur. iv. p. 80 (1816) ... ... *taraxaci.*

Sect. I. Antennæ of male bipectinate.

A. Forewing cupreous red-brown, the orbicular and reniform white surrounded by white points .. .. *cupricolor.*
B. Forewing obscure brown, the reniform with white point .. .. *micra.*

(1) Caradrina cupricolor, n. sp.

♂. Head and thorax cupreous red-brown; antennæ, hind legs, and abdomen ochreous. Forewing cupreous red-brown; faint traces

of a sinuous antemedial dark line; a more distinct postmedial line excurved beyond cell; the orbicular and reniform white surrounded by white points. Hindwing white slightly tinged with ochreous towards termen.

Hab. Delagoa Bay (Mrs. Monteiro). *Exp.* 22 mill. Type in B.M.

(2) Caradrina micra, n. sp.

Dull brown. Forewing with faint traces of a sinuous antemedial line; a rather more distinct waved postmedial line strongly excurved beyond the cell; the reniform represented by a white point: a terminal series of dark points. Hindwing white; the costal area suffused with brown.

Ab. 1. The whole hindwing suffused with brown.

Hab. Natal, Durban (Bowker). *Exp.* ♂ 22, ♀ 26 mill. Type in B.M.

Sect. II. Antennæ of male serrate and fasciculate.

A. Forewing grey-brown.
  a. Forewing with the orbicular stigma whitish and well developed .. .. *abyssinia.*
  b. Forewing with the orbicular and reniform whitish with rufous centres, the former minute .. .. *rufipuncta.*
  c. Forewing with the orbicular stigma fuscous, minute .. .. *microtera.*
B. Forewing dark red-brown .. .. *tenebrata.*

(3) Caradrina abyssinia, Guen. Noct. i. p. 154 (1852).
  ,, *insignata*, Wlk. x. 295 (1856).
  Laphygma obliterans, Wlk. Trans. Ent. Soc. (3) i. p. 87 (1862).
  Hab. West Africa, Sierra Leone, Niger River; Abyssinia; Natal (Gooch); Cape Colony, Knysna (Trimen); Rodrigues; Persia. *Exp.* 30 mill.

(4) Caradrina rufipuncta, n. sp.

♂. Head and thorax grey; palpi black at sides, white towards tips; abdomen white tinged and irrorated with brown. Forewing pale brownish grey, irrorated with a few black scales; the orbicular and reniform small whitish with rufous centres; faint traces of curved antemedial and medial lines; the postmedial line rather more distinct, bent outwards below costa, excurved to vein 3, then incurved and with a series of minute dentate black marks beyond it; a more distinct sinuous subterminal line. Hindwing pale fuscous brown.

Hab. Cape Colony, Annshaw (Miss F. Barrett). *Exp.* 26 mill. Type in B.M.

(5) Caradrina microtera, n. sp.

♂. Grey-brown; palpi with the second joint black at sides. Forewing with highly waved fine black antemedial line; the orbicular and reniform small, dark; the postmedial line strongly bent outwards below costa, then dentate, incurved below vein 3; traces of an irregular subterminal line; a terminal series of black points. Hindwing white, the terminal area tinged with fuscous, broadly towards costa.

♀. Hindwing with the apical area only suffused with fuscous.

Hab. Mashonaland, Salisbury (Marshall). *Exp.* 24 mill. Type in B.M.

(6) Caradrina tenebrata, n. sp.

Dark red-brown. Forewing with short subbasal line; two waved antemedial lines; the reniform small, indistinct, chestnut; two postmedial lines bent outwards below costa and incurved below vein 3; an indistinct sinuous subterminal line. Hindwing paler towards base; an indistinct discoidal lunule; a fine ochreous line at base of cilia; under side with black discoidal lunule and curved postmedial line.

Hab. Mashonaland, Salisbury (Marshall); Cape Colony, Transkei (Miss F. Barrett). *Exp.* 28 mill. Type in B.M.

Sect. III. Antennæ of male ciliated.

A. Abdomen of male with lateral tufts of long hair from base.

(7) Caradrina atrosignata, Wlk. xxxiii. 747 (1865).

Hab. Natal (Gueinzius), Durban (Leigh); Cape Colony, Transkei (Miss F. Barrett). *Exp.* 38 mill.

B. Abdomen of male without lateral tufts of hair.

a. Forewing with the reniform white.

a^1. Forewing with the reniform surrounded by white points .. .. *satellitia.*

b^1. Forewing without white points round the reniform .. *albirena.*

b. Forewing with the reniform not white.

a^1. Forewing with the orbicular pale.

a^2. Forewing with the orbicular rounded .. .. .. *exigua.*

b^2. Forewing with the orbicular oblique elliptical .. *orbicularis.*

b^1. Forewing with the orbicular dark.

a^2. Forewing pale grey-brown.

a^3. Forewing with the reniform not black.

a^4. Forewing with black points on costa .. *quadripunctata.*

b^4. Forewing without black points on costa .. *partita.*

b^3. Forewing with the reniform black.
a^4. Hindwing brown.
a^5. Forewing with black spots on inner side of subterminal line; the reniform obsolescent .. .. *melanosticta.*
b^5. Forewing without black spots on inner side of subterminal line; the reniform large, prominent.
a^6. Forewing with black orbicular stigma .. .. *absorbens.*
b^6. Forewing without orbicular stigma *atrirena.*
b^4. Hindwing white .. .. *indicata.*
b^2. Forewing dark fuscous grey.
a^3. Forewing with the reniform black or deep rufous with pale outline .. .. *capicola.*
b^3. Forewing with the reniform without pale outline.
a^4. Forewing with terminal series of black points.
a^5. Forewing without dark suffusion before the postmedial line .. .. *glauca.*
b^5. Forewing with dark suffusion before the postmedial line, especially on inner area .. .. *transversa.*
b^4. Forewing without terminal series of black points.
a^5. Hindwing with curved dark postmedial line .. .. *pallicornis.*
b^5. Hindwing without postmedial line.
a^6. Hindwing white, the apical area tinged with fuscous .. .. *xantholopha.*
a^6 Hindwing tinged with fuscous brown especially on terminal area *smintha.*

(8) Caradrina satellitia, n. sp.

♀. Greyish brown; head whitish; palpi black above; tarsi black ringed with white. Forewing with white points on costa at the lines; white points in cell before and at middle; the reniform white surrounded by white points; a short dark subbasal line; a waved antemedial line; the postmedial line crenulate, strongly bent outwards below costa and incurved below vein 3; a sinuous subterminal line; a terminal series of pale and dark points. Hindwing pale strongly suffused with brown, the inner area paler; the cilia ochreous at tips except towards apex.

Hab. Delagoa Bay (H. Junod); Natal, Victoria District (Gooch), Durban (Leigh). *Exp.* 32 mill. Type in B.M.

(9) Caradrina albirena, n. sp.

♂. Fuscous black slightly mixed with ochreous. Forewing with indistinct waved whitish antemedial line; the reniform white with yellowish mark on it, outlined with black and with white mark above it on costa; faint traces of a pale sinuous postmedial line excurved

beyond the cell; a white point on costa before apex and another above tornus. Hindwing pale, suffused with fuscous especially on terminal area; a slight dark discoidal spot.

Hab. **Mashonaland,** Salisbury (Marshall); **N'Gamiland** (Lugard). *Exp.* 20 mill. Type in B.M.

(10) Caradrina exigua, Hübn. Samml. Eur. Schmett. Noct. fig. 362 (1827).

Laphygma cycloides, Guen. Noct. i. p. 157 (1852).

,, *caradrinoides*, Wlk. ix. 190 (1856).

Hab. Almost universally distributed; **N'Gamiland** (Lugard) **Natal,** Estcourt (Hutchinson); Durban. *Exp.* 26–32 mill.

(11) Caradrina orbicularis, Wlk. x. 294 (1856).

,, *præterita*, Wlk. x. 294 (1856).

Laphygma imperviata, Wlk. xxxii. 651 (1865).

Hab. **Socotra; British East Africa; Mashonaland,** Salisbury (Marshall); **Cape Colony** (Dr. A. Smith), Knysna (Trimen). *Exp.* 32 mill.

(12) Caradrina quadripunctata, Fabr. Syst. Ent. p. 594 (1775).

,, *excisa*, Herr.-Schäff. Lep. Exot. fig. 129 (1850), var.

,, *pulverosa*, Wlk. x. 295 (1856).

,, *huegeli*, Feld. Reis. Nov. pl. 109, f. 13 (1874).

,, *pervicax*, Wllgrn. Öfv. Vet. Akad. Förh. 1875, p. 107

Hab. **Europe; British East Africa,** Machakos; **Mashonaland,** Salisbury (Marshall); **Transvaal; Natal,** Estcourt (Hutchinson); **Cape Colony,** Transkei (Miss F. Barrett); **India; Ceylon.** *Exp.* 30 mill.

(13) Caradrina partita, Wlk. x. 294 (1856).

,, *obtusa*, Hmpsn. Ill. Het. viii. p. 79, pl. 145, f. 6 (1891).

Hab. **West Africa,** Congo; **Sokotra; N'Gamiland** (Lugard); **Natal** (Gooch); **Cape Colony,** Transkei (Miss F. Barrett); **Southern India; Burma.** *Exp.* ♂ 28, ♀ 30 mill.

(14) Caradrina melanosticta, Hmpsn. Ill. Het. B.M. viii. p. 79, pl. 145, f. 13 (1891).

Hab. **Natal,** Durban (Leigh); **Southern India.** *Exp.* 28 mill.

(15) Caradrina absorbens, Wlk. x. 403 (1856).

Hab. **Cape Colony** (Dr. Smith). *Exp.* 36 mill.

(16) Caradrina atrirena, n. sp.

♂. Grey-brown; palpi blackish at sides; tibiæ and tarsi blackish with pale bands. Forewing irrorated with black; a subbasal black point on costa with traces of a short line from it; a sinuous antemedial line arising from a black point on costa; a black discoidal lunule on the medial line which is oblique towards costa and angled inwards in submedian fold; a crenulate postmedial line bent outwards below costa and incurved to near the medial line below vein 3; an obscure irregularly sinuous subterminal line with darker patch on costa; a terminal series of black points. Hindwing suffused with fuscous towards termen; base of cilia ochreous; the under side with discoidal lunule and curved postmedial line.

Hab. **Cape Colony,** Worcester District. *Exp.* 32 mill. Type in B.M.

(17) Caradrina indicata, Wlk. x. 299 (1856).

Hab. **St. Helena; British East Africa,** Machakos; **Matabeleland,** Gwelo River (Oates). *Exp.* 26 mill.

(18) Caradrina capicola, Herr.-Schäff. Lep. Exot. f. 131 (1850).

Hab. **Cape Colony,** Transkei (Miss F. Barrett). *Exp.* 26 mill.

(19) Caradrina glauca, n. sp.

Head, thorax, and abdomen grey mixed with dark fuscous brown; palpi black at sides. Forewing grey irrorated with black; a short subbasal line; a strongly waved black antemedial line; the orbicular and reniform distinct, black; a crenulate black postmedial line bent outwards below costa and somewhat incurved below vein 3, the lines with some whitish scales on each side of them; a sinuous grey subterminal line; a terminal series of black points. Hindwing white, the costal area and a terminal line fuscous brown; female with the hindwing largely suffused with fuscous.

Hab. **British East Africa,** Machakos (Crawshay); **Mashonaland,** Salisbury (Marshall); **Natal,** Estcourt (Hutchinson), Mooi River. *Exp.* 30 mill.

(20) Caradrina transversa, Moore, Lep. Atk. p. 95, pl. 4, f. 5 (1879).

Hab. **Nigeria,** Yelwa Lake; **Mashonaland,** Umtali (Marshall); **Cape Colony,** Annshaw (Miss F. Barrett); **India; Ceylon.** *Exp.* 32 mill.

(21) Caradrina pallicornis, Feld. Reis. Nov. pl. 109, f. 20 (1874).
Hab. **Cape Colony,** Transkei (Miss F. Barrett), Knysna (Trimen). *Exp.* 36 mill.

(22) Caradrina xantholopha, n. sp.

Head and thorax clothed with fuscous, reddish brown, and grey scales; palpi black, whitish at tips; tibiæ of male fringed with ochreous hair; abdomen pale irrorated with fuscous, the genital tufts of male pale yellow. Forewing reddish brown irrorated with fuscous, the costal and terminal areas suffused with greyish fuscous; an indistinct waved antemedial line bent inwards to costa; orbicular a black point; reniform indistinctly defined by black; postmedial line indistinct, waved, bent outwards beyond the cell; traces of a waved subterminal line; a terminal series of black points. Hindwing yellowish semihyaline white, the costal area tinged with fuscous.

Hab. **Natal,** Estcourt (Hutchinson); **Cape Colony,** Transkei (Miss F. Barrett). *Exp.* 28–32 mill. Type in B.M.

(23) Caradrina smintha, n. sp.

Head and thorax obscure grey-brown; palpi blackish at sides; abdomen ochreous irrorated with brown in male, grey-brown in female. Forewing dull grey-brown; traces of a waved subbasal line; an indistinct waved antemedial line; orbicular and reniform outlined by a few black scales, the latter placed on an obscure waved medial shade; an indistinct crenulate postmedial line, bent outwards below costa, excurved to vein 3, then oblique; traces of a sinuous subterminal line. Hindwing yellowish white suffused with brown especially on the veins and costal area, more completely suffused in female.

Hab. **Natal,** Durban (Leigh); **Cape Colony,** Transkei (Miss F. Barrett). *Exp.* 30–36 mill. Type in B.M.

Auctorum.

Caradrina singula, Möschl. Verh. Zool. bot. Ges. Wien. xxxiii. p. 292, pl. xvi., f. 6 (1883)	Cape Colony.
Caradrina orbata, Möschl. Verh. Zool. bot. Ges. Wien. xxxiii. p. 293, pl. xvi., f. 7 (1883)	Cape Colony.
Caradrina murcida, Wllgrn. Öfv. Vet. Akad. Förh. 1875, p. 107	Transvaal.

Genus ACRAPEX.

	Type.
Acrapex, Hmpsn. Moths Ind. ii. p. 286 (1894) ...	*prisca.*

A. Forewing with the ground colour fuscous .. .. *leucophlebia.*
Forewing with the ground colour pinkish.
a. Forewing with straight white fascia in discal fold .. .. .. *ænigma.*
b. Forewing with the white fascia curved upwards beyond the cell .. .. *curvata.*

(1) Acrapex leucophlebia, Hmpsn. Moths Ind. ii. p. 287 (1894).
Hab. **Mashonaland,** Salisbury (Marshall); **Natal,** Karkloof (Marshall), Estcourt (Hutchinson), Durban (Gooch, Bowker); **Cape Colony,** Transkei (Miss F. Barrett). *Exp.* 22–31 mill.

(2) Acrapex ænigma, Feld. Reis. Nov. pl. 108, f. 47 (1874).
Hab. **Cape Colony,** Annshaw (Miss F. Barrett). *Exp.* 26–28 mill.

(3) Acrapex curvata, n. sp.
Head and thorax white tinged with pale brown; abdomen white. Forewing white tinged with pink; the veins white; a white fascia above median nervure curved up towards apex beyond the cell and defined by fuscous suffusion below it; a fine dark terminal line. Hindwing yellowish white with fine brownish terminal line.
Hab. **British East Africa,** Muani (Betton); **Matabeleland,** Gwelo River (Oates). *Exp.* 36 mill.

Sub-Family EUTELIANÆ.

Genus EUTELIA.

	Type.
Eutelia, Hübn. Verz. p. 259 (1827)... ...	*adulatrix.*
Phlegetonia, Guen. Noct. ii. p. 301 (1852)	*catephioides.*
Pacidara, Wlk. xxxiii. 831 (1865)	*venustissima.*
Colpocheilopteryx, Wllgrn. Svensk. Akad. Handl. v. 4, p. 57 (1866)	*operatrix.*

Sect. I. Antennæ of male bipectinate with the apical half simple.

A. Fore tibiæ of male tufted with hair, mid tibiæ and tarsi with immense tufts, hind tibiæ with slight tufts; abdomen with lateral tufts of long spatulate hairs, the anal tufts very long; forewing with the termen angled at vein 3.

(1) Eutelia venustissima, Wlk. xxxiii. 831 (1865).
Hab. **West Africa**, Niger; **Natal** (Gueinzius, Gooch). *Exp.* 56–64 mill.

B. Tibiæ and tarsi without large tufts of hair.

(2) Eutelia histrio, Saalm. Lep. Mad. p. 386 (1891).
Hab. **Natal** (Gooch); **Madagascar.** *Exp.* 30 mill.

Sect. II. Antennæ of male bipectinate with very short fasciculate branches to apex.

(3) Eutelia rivata, n. sp.
Grey-brown; palpi with black spot at base; abdomen with fine pale subdorsal streaks and segmental lines on basal segments. Forewing with highly curved grey antemedial line defined by dark brown on each side and intersected in cell by a pale wedge-shaped fascia which extends to the reniform which is pale-edged and lunulate; the median nervure, bases of veins 2, 3, 4, and medial part of vein 1 pale-streaked; the postmedial line pale defined by dark brown on inner side, outwardy oblique from costa to vein 6 where it is sharply angled, then inwardly oblique and sinuous; a whitish subterminal line angled outwards to termen on vein 6 then inwards on vein 5, then excurved and straight towards tornus. Hindwing with the basal half whitish; a pale sinuous subterminal line; a ferruginous mark at tornus; both wings with fine pale line at base of cilia; under side with prominent black discoidal spot and postmedial line angled outwards at vein 6.
Hab. **Natal,** Victoria District (Gooch), Durban (Bowker). *Exp.* 38 mill. Type in B.M.

Sect. III. (*Eutelia*). Antennæ of male serrate and fasciculate.

A. Forewing with the antemedial line oblique .. .. *ocularis.*
B. Forewing with the antemedial line excurved at middle.
a. Forewing with the ground colour ochreous .. .. *callichroma.*
b. Forewing with the ground colour olive-grey .. .. *amatrix.*
c. Forewing with the ground colour dark brown .. .. .. *catephioides.*

(4) Eutelia ocularis, Saalm. Lep. Mad. p. 388, f. 202 (1891).
Hab. **West Africa,** Old Calabar, Nigeria; **Cape Colony,** Transkei (Miss F. Barrett); **Madagascar.** *Exp.* 36 mill.

(5)*Eutelia callichroma, Dist. Entom. 1901, p. 284.
Hab. **Delagoa Bay; Transvaal.** *Exp.* 28 mill.

(6) Eutelia amatrix, Wlk. xv. 1778 (1858).
Eurhipia bowkeri, Feld. Reis. Nov. pl. 119, f. 29 (1874).
Eutelia exquisita, Saalm. Lep. Madag. p. 379, f. 175 (1891).
Hab. **Sokotra**; **British East Africa**, Kilima'njaro; **Natal** (Bowker, Gooch); **Madagascar.** *Exp.* 38 mill.

(7) Eutelia catephioides, Guen. Noct. ii. p. 301 (1852).
Hab. **Natal**, Durban (Bowker); **Cape Colony.** *Exp.* 40 mill.

Sect. IV. (*Targalla*). Antennæ of male almost simple.

A. Forewing pale yellow with the base and a patch on costa before apex purple .. .. *operatrix.*
B. Forewing with the ground colour grey-brown or chestnut-brown.
a. Forewing with two dark discoidal points .. .. *polychorda.*
b. Forewing with the reniform dark with whitish before and beyond it .. .. *cistellatrix.*
c. Forewing with the reniform whitish .. .. *symphonica.*
d. Forewing with small tuft of red scales on the reniform .. *favillatrix.*

(8)*Eutelia operatrix, Wllgrn. Wien. Ent. Mon. iv. p. 170 (1860).
Hab. **Cape Colony**, Caffraria. *Exp.* 40 mill.

(9) Eutelia polychorda, n. sp.
♂. Pale chestnut-brown sometimes tinged with grey; the scales of head and thorax pencilled with grey; pectus and ventral surface of abdomen whitish. Forewing with fine double slightly waved subbasal, two antemedial and two postmedial lines slightly angled outwards below costa and the first postmedial line excurved beyond cell; two minute black discoidal points; a minutely dentate subterminal line with some white points on it towards costa; a minutely dentate terminal line. Hindwing with the interspaces semihyaline except on terminal third; traces of a waved ochreous subterminal line towards tornus; a waved ochreous terminal line; under side with discoidal black point and a terminal series.
♀. Grey-brown.
Hab. **Mashonaland**, Umtali, Salisbury (Marshall); **Damaraland**; **N'Gamiland** (Lugard); **Cape Colony** (Trimen). *Exp.* 30–34 mill. Type in B.M.

(10) Eutelia cistellatrix, Wllgrn. Wien. Ent. Mon. iv. p. 170 (1860).
Aglossa ocularis, Butl. A.M.N.H. (4) xvi. p. 412 (1875).
Hab. **Natal** (Burrows); **Cape Colony**, Caffraria. *Exp.* 34 mill.

(11) Eutelia symphonica, n. sp.

♀. Grey-brown tinged with olive and irrorated with black. Forewing with the basal area sometimes suffused with black; double black minutely waved subbasal and antemedial lines filled in with grey; reniform whitish with a dark lunule on it; a double waved postmedial line excurved from below costa to vein 3 with black patches before and beyond it beyond the cell; a minutely dentate white subterminal line with black spot beyond it below apex; a crenulate black line just before termen. Hindwing with the interspaces semihyaline except on terminal half; a slight white line with blackish marks on each side of it above tornus; traces of a pale waved subterminal line.

Hab. **German East Africa,** Tanga; **Natal,** Victoria District (Gooch). *Exp.* 30 mill. Type in B.M.

(12) Eutelia favilatrix, Wlk. xv. 1778 (1858). Hmpsn. Ill. Het. B.M. ix. pl. 163, f. 15.

Hab. **British East Africa,** Athi-ya-Mawe; **Mashonaland,** Umtali (Marshall); **India; Ceylon.** *Exp.* 28 mill.

Sub-Family STICTOPTERINÆ.

Genus STICTOPTERA.

	Type.
Stictoptera, Guen. Noct. iii. p. 51 (1852)...	*cucullioides.*

A. Hindwing with the basal semihyaline area largely suffused with black, the veins traversing it black .. .. *alutacea.*
B. Hindwing with the basal semihyaline area not suffused with black.
a. Hindwing with the median veins on hyaline area white .. *methyalea.*
b. Hindwing with the median veins dark .. .. *cucullioides.*

(1) Stictoptera alutacea, Feld. Reis. Nov. pl. 112, f. 4 (1874).

Hab. **British East Africa; Natal,** Durban (Leigh); **Cape Colony,** Transkei (Miss F. Barrett), Murraysberg (Trimen). *Exp.* 28–30 mill.

(2) Stictoptera methyalea, n. sp.

♂. Black-brown; pectus and abdomen below white irrorated with brown. Forewing with the basal area suffused with black; a double very highly dentate antemedial line followed by a line which is oblique from costa to submedian fold where it is obtusely angled;

medial and postmedial waved lines excurved from below costa to vein 3, the latter then incurved and approximated to former; a sinuous subterminal line with some blackish suffusion between it and the postmedial line; two obliquely placed subapical black striæ. Hindwing hyaline white to beyond middle; the costal and inner areas black; the terminal third black with sinuous inner edge; cilia white.

Hab. **Mashonaland,** Salisbury (Marshall). *Exp.* 30 mill. Type in B.M.

(3) Stictoptera cucullioides, Guen. Noct. iii. p. 52 (1852).
Hab. **West Africa,** Niger, Congo; **Cape Colony,** Transkei (Miss F. Barrett); **India, Ceylon,** and **Burma; Singapore; Java.** *Exp.* 36–46 mill.

Sub-Family SARROTHRIPINÆ.

A. Forewing with an areole.
  a. Palpi upturned .. .. *Blenina.*
  b. Palpi porrect .. .. *Plotheia.*
B. Forewing with veins 7, 8, 10 stalked, 9 absent .. .. *Poliothripa.*

Genus BLENINA.

Type.
Blenina, Wlk. xiii. 1214 (1857) ... ... *donans.*

A. Hindwing with the ground colour white .. .. *squamifera.*
B. Hindwing with the ground colour yellow .. .. *quadripuncta.*

(1) Blenina squamifera, Wllgrn. Wien. Ent. Mon. iv. p. 171 (1860).
Acronycta lichenosa, Feld. Reis. Nov. pl. 100, f. 9 (1874).
Diphthera autumnalis, Dist. A.M.N.H. (7) i. p. 222 (1898).
Hab. **N'Gamiland** (Lugard); **Transvaal; Natal,** Estcourt (Hutchinson); **Cape Colony,** Annshaw (Miss F. Barrett). *Exp.* 30 mill.

(2)*Blenina quadripuncta, n. sp.

♀. Head and thorax white tinged with green and irrorated with brown; mid femora and hind legs pale yellow; abdomen yellow dorsally tinged with brown. Forewing white, the costal and basal areas irrorated with green and black, the antemedial area with brown scales; a waved black subbasal line from costa to submedian fold; an interrupted waved antemedial line strongly bent outwards to

inner margin; a small black tuft in middle of cell and three on disco-cellulars; four blackish striæ on medial part of costa; the terminal area dark brown and with some brown irroration before it and traces of a waved white subterminal line; a terminal series of dark points; cilia with some white below middle. Hindwing yellow; the costal area tinged with brown; a brown terminal band with sinuous inner edge; cilia yellow except at apex. Under side yellow; forewing suffused with brown except basal, costal, and inner areas; hindwing with brown terminal band.

Hab. **Delagoa Bay.** *Exp.* 38 mill. Type in Coll. Druce.

Genus PLOTHEIA.

	Type.
Plotheia, Wlk. xiii. 1108 (1857)	*decrescens.*

A. Hindwing semihyaline white .. .. *celtis.*
B. Hindwing brown .. .. *polyhymnia.*

(1) Plotheia celtis, Moore, Lep. E.I.C. p. 253, pl. 16, f. 8, 8a. (larva) (1859) id. Lep. Ceyl. iii. pl. 158, f. 5.

Hab. **Cape Colony**, Annshaw (Miss F. Barrett); **India**; **Ceylon**; **Java.** *Exp.* 24–30 mill.

(2) Plotheia polyhymnia, n. sp.

♀. Grey-brown; fore tibiæ and tarsi with slight black bands; abdomen with the dorsal tufts black. Forewing with diffused black fascia on median nervure; a black fascia on vein 5 not reaching termen but met by an oblique streak from termen below apex; the orbicular and reniform small, pale, indistinct; indistinct highly waved antemedial, medial, and postmedial lines, the last oblique from costa to vein 5, then inwardly oblique; an irregular subterminal line; the veins with short black streaks at termen. Hindwing pale reddish brown.

Ab. 1. Forewing with the black fasciæ almost obsolete.

Hab. **Natal**, Durban (Leigh). *Exp.* 36 mill.

Genus POLIOTHRIPA, nov.

Proboscis aborted, minute; palpi porrect, downcurved, extending about twice the length of head, the second joint roughly scaled; antennæ of female ciliated; tibiæ with the spurs long. Forewing with vein 3 from well before angle of cell, 5 from just above angle;

6 from below upper angle ; 7, 8, 10 stalked, 9 absent, 10 from beyond 7; 11 from cell. Hindwing with veins 3, 4 coincident ; 5 from above angle of cell ; 6, 7 shortly stalked; 8 anastomosing with the cell near base.

Poliothripa niphostena, n. sp.

♀. Head and thorax pure white ; palpi blackish except at tips ; antennæ brownish except at base ; pectus, legs, and abdomen fuscous brown. Forewing fuscous brown with confluent white bands and patches occupying the greater part of wing; a basal patch, a broad antemedial band, a medial band from cell to inner margin, a sinuous band just beyond the cell from costa to vein 2 and a sinuous post-medial band bent outwards to apex with two white points on costa before it. Hindwing fuscous brown.

Hab. **Natal.** *Exp.* 26 mill.

Sub-Family ACONTIANÆ.

A. Forewing with an areole.
  a. Forewing with the termen angled at vein 4 .. .. .. *Acripia.*
  b. Forewing with the termen not angled at vein 4.
    a^1. Forewing with scale-tooth and lobe on middle of inner margin .. .. *Arcyophora.*
    b^1. Forewing with the inner margin curved.
      a^2. Palpi with the third joint very long and somewhat dilated at extremity .. .. *Maurilia.*
      b^2. Palpi with the third joint moderate, slender .. .. *Westermannia.*
B. Forewing with veins 7, 8 and 9, 10 stalked .. .. *Acontia.*
C. Forewing with veins 8, 9 absent in ♂, 9 absent in ♀ .. .. *Neaxestis.*
D. Forewing with veins 7, 8, 9 stalked.
  a. Forewing with lobe and scale-tooth on inner margin .. *Paraxestis.*
  b. Forewing without lobe and scale-tooth on inner margin .. *Rhyncodes.*
E. Forewing with veins 8, 9, 10 stalked .. .. *Erizada.*

Genus ACRIPIA.

	Type.
Acripia, Wlk. xxvii. 9 (1863)	*subolivacea.*

A. Forewing with the apical area not tinged with green.
  a. Thorax, base, and medial area of forewing dark red-brown with pale mottlings .. .. *scapularis.*
  b. Thorax, base, and medial area of forewing brownish grey .. *subolivacea.*
B. Forewing with the apical area tinged with green.
  a. Tegulæ fulvous yellow .. .. *leprosa.*
  b. Tegulæ fuscous edged with white .. .. *chloropera.*

(1)*Acripia scapularis, Feld. Reis. Nov. pl. 111, f. 9 (1874).
Hab. **Cape Colony,** Knysna. *Exp.* 34 mill.

(2) Acripia subolivacea, Wlk. xxvii. 9 (1863).
Plastenis marginea, Feld. Reis. Nov. pl. 111, f. 8 (1874).
Hab. **Cape Colony** (Dr. Smith). *Exp.* 32 mill.

(3)*Acripia leprosa, Feld. Reis. Nov. pl. 111, f. 10 (1874).
Hab. **Cape Colony,** Capetown. *Exp.* 34 mill.

(4) Acripia chloropera, n. sp.

♀. Head and tegulæ white mixed with dark brown; patagia and thorax chocolate-brown; pectus and legs white, the latter irrorated with fuscous and the tarsi banded with black; abdomen dark brown with ochreous segmental lines, the ventral surface white irrorated with brown. Forewing chocolate-brown with numerous fine striæ; an inverted **V**-shaped mark from middle of costa to inner margin near base and at tornus; a black point in middle of cell and a discoidal spot with pale centre; an apical green patch; some black subterminal points on costal half. Hindwing brown with blackish discoidal spot; the cilia ochreous. Under side with the costal area of forewing and the hindwing grey-white with fine black striæ.

Hab. **Cape Colony,** Annshaw (Miss F. Barrett). *Exp.* 34 mill. Type in B.M.

Genus ARCYOPHORA.

	Type.
Arcyophora, Guen. Noct. ii. p. 378 (1852) ...	*longivalvis.*
Setoctena, Wllgrn. Wien. Ent. Mon. vii. p. 144 (1863)	*ledereri.*
Euxestis, Led. Hor. Soc. Ent. Ross, vi. p. 88 (1869)	*mesogona.*
Pseudocalpe, Hmpsn. Moths Ind. ii. p. 566 (1894)	*angulifera.*

A. Forewing with the medial line oblique .. .. *longivalvis.*
B. Forewing with the medial line curved.
a. Forewing with the postmedial line angled outwards at veins 6 and 4 .. .. *stali.*
b. Forewing with the postmedial line excurved at middle .. .. *ledereri.*

(1) Arcyophora longivalvis, Guen. Noct. ii. p. 379, pl. 12, f. 9 (1852).

Calpe apicalis, Wlk. xxxiii. 848 (1865).
Hab. **Aden**; **N'Gamiland** (Lugard); **Natal** (Gueinzius). *Exp.* 34–50 mill.

(2) Arcyophora stali, Wllgrn. Wien. Ent. Mon. iv. p. 144 (1860).
Hab. **N'Gamiland** (Lugard). *Exp.* 26 mill.

(3)*Arcyophora ledereri, Wllgrn. Wien. Ent. Mon. vii. p. 144 (1863).
Hab. **Cape Colony.** *Exp.* 26 mill.

Genus MAURILIA.

	Type.
Maurilia, Möschl. Verh. z. b. Wien. xxxiii. p. 298 (1884)	*arcuata.*

A. Forewing produced at apex, the lines very oblique .. .. *patricula.*
B. Forewing with the apex rectangular, the line not oblique .. .. *arcuata.*

(1) Maurilia patricula, n. sp.

Head and thorax yellow-brown or grey pencilled with pale and dark brown scales; abdomen ochreous dorsally tinged with brown. Forewing brown or yellow-brown, the basal half of costal area red-brown; very numerous fine grey striæ; a very obliquely curved medial pale line defined by fuscous on outer side; a similar post-medial line very acutely angled at vein 6 where it is met by an oblique dark streak from apex. Hindwing semihyaline white, the termen and cilia tinged with yellow or the termen with fuscous.

Hab. **Abyssinia**; **Mashonaland,** Salisbury (Marshall). *Exp.* 40–46 mill.

Almost exactly like *Arcyophora longivalvis*, Guen., except that the inner margin of forewing is evenly curved.

(2) Maurilia arcuata, Wlk. xii. 779 (1857).
,, *lubina*, Möschl. Verh. z. b. Wien. xxxiii. p. 298, pl. xvi. f. 13 (1884).
Hab. **West Africa**; **Abyssinia**; **British East Africa**; **Mashonaland,** Salisbury (Marshall); **Natal,** Durban (Bowker); **Cape Colony,** Transkei (Miss F. Barrett), Grahamstown. *Exp.* 38–42 mill.

Auctorum.

Xanthia basalis, Wlk. Trans. Ent. Soc. (3) i. p. 88 (1862), type lost ... ... South Africa.

Genus WESTERMANNIA.

Type.

Westermannia, Hübn. Zütr. ii. 23 (1827) ... *superba.*

A. Forewing white with faint lines.. .. .. *nivea.*
B. Forewing brown with the ante- and post-medial lines meeting on inner margin .. .. *convergens.*

(1) Westermannia nivea, n. sp.

Pure white; palpi, antennæ, legs, and abdomen tinged with ochreous. Forewing with the costa ochreous; an indistinct medial series of yellowish grey spots excurved from costa to median nervure; obscure spots on discocellulars and beyond the cell; an oblique minutely waved postmedial line angled inwards below vein 2; a minutely waved subterminal line; three small spots just before termen below apex; a terminal series of striæ; ciliæ irrorated with brown. Hindwing with slight brownish suffusion towards termen; the veins, termen, and cilia yellowish.

Hab. **Mashonaland,** Salisbury (Marshall). *Exp.* 32 mill. Type in B.M.

(2) Westermannia convergens, n. sp.

♂. Head and thorax pale rufous brown; palpi tinged with fuscous; abdomen whitish tinged with brown. Forewing pale chocolate-brown slightly irrorated with black; the basal area tinged with grey; an oblique pale antemedial line met on inner margin by the postmedial line which is strongly excurved beyond cell, then very oblique and with a yellowish patch beyond it on costa. Hindwing yellowish white.

♀. Forewing without the yellowish patch beyond the postmedial line; hindwing fuscous.

Hab. **Cape Colony,** Annshaw (Miss F. Barrett). *Exp.* ♂ 28, ♀ 30 mill.

Genus ACONTIA.

Type.

Acontia, Ochs. Eur. Schmett. iv. p. 91 (1816) *malvæ.*
Thiganusa, Wlk. xxxiii. 979 (1865)... ... ... *apollinis.*

A. Forewing with black spot in end of cell .. .. *apollinis.*
B. Forewing without black spot in end of cell.
a. Forewing without transverse lines .. .. *grællsi.*
b. Forewing with ante- and post-medial lines .. .. *malvæ.*

(1) Acontia apollinis, Guen. Noct. ii. 212 (1852).
Thiganusa euproctoides, Wlk. xxxiii. 979 (1865).
Hab. **Natal** (Burrows, Gooch). *Exp.* 42 mill.

(2) Acontia grællsi, Feisth. Ann. Soc. Ent. Fr. vi. p. 300, pl. 12, f. 3 (1837).
Hab. **Southern Europe**; **West Africa**, Sierra Leone; **Abyssinia**; **British Central Africa**; **Mashonaland**, Salisbury (Marshall); **Natal** (Gooch), Estcourt (Hutchinson); **Mauritius**; **Aden**; **India**; **Burma**. *Exp.* 36–43 mill.

(3) Acontia malvæ, Esp. Schmett. iv. 2, p. 63, pl. 195, f. 4 (1777).
Hab. **S. Europe**; **Transvaal**; **Natal**; **Formosa**; **India**; **Ceylon**. *Exp.* 30–36 mill.

Genus NEAXESTIS, nov.

Proboscis fully developed; palpi upturned, slender, reaching vertex of head; frons rounded; antennæ with fasciculate cilia; tibiæ with the spurs long; hind tibiæ with tuft of hair at extremity. Forewing with vein 3 from before angle of cell; 4, 5 from angle; 6, 7 from upper angle, 8, 9 absent in male, female with 8 shortly stalked with 7, 9 absent; 10, 11 from cell. Hindwing with veins 3, 4, 5 from angle of cell; 6, 7 from upper angle.

A. Forewing with the antemedial line acutely angled .. .. .. *acutangula.*
B. Forewing with the antemedial line obliquely curved .. .. .. *griseata.*

(1) Neaxestis actuangula, n. sp.

Head and thorax yellow-brown, the head pale; abdomen whitish, dorsally tinged with brown. Forewing yellow-brown irrorated with fuscous; the costal edge whitish; the lines pale yellow; the antemedial line acutely angled on median nervure and very oblique towards costa and inner margin; the postmedial line very acutely angled at vein 6, its point curved upwards towards apex, then extremely oblique. Hindwing ochreous white, the termen and cilia tinged with red-brown.

Hab. **Cape Colony**, Annshaw (Miss F. Barrett). *Exp.* ♂ 26, ♀ 30 mill.

(2) Neaxestis griseata, n. sp.

♂. Head and thorax white; tegulæ tinged with pink, vertex of thorax brown; abdomen white dorsally tinged with brown. Fore-

wing ferruginous irrorated with brown; the costa white with some grey on edge; an obliquely curved antemedial grey band; a postmedial grey band angled outwards to termen below apex, then oblique to middle of inner margin towards which it has some grey beyond it. Hindwing white, the termen yellowish.

Hab. **Mashonaland,** Umtali (Marshall). *Exp.* 30 mill. Type in B.M.

Genus PARAXESTIS, nov.

Proboscis fully developed; palpi upturned flattened against frons, smoothly scaled and reaching vertex of head; antennæ of male with fasciculate cilia; tibiæ with the spurs long, the hind tibiæ with tuft of hair at extremity. Forewing with the retinaculum bar-shaped in male; a lobe and tuft of scales on inner margin; vein 3 from before angle of cell; 4, 5 from angle; 6 from below upper angle; 7, 8, 9 stalked; 10, 11 from cell. Hindwing with veins 3, 4, 5 from angle of cell; 6, 7 from upper angle.

Paraxestis rufescens, n. sp.

♂. Brownish ochreous; head and thorax tinged with pink; pectus and ventral surface of abdomen white. Forewing tinged with rufous; a fine dark antemedial line acutely angled on median nervure, then obliquely incurved; the postmedial line acutely angled on vein 5 then incurved and oblique, below vein 2 giving off a curved line to inner margin before tornus. Hindwing yellowish white.

Hab. **Natal,** Durban (Bowker). *Exp.* 26 mill. Type in B.M.

Genus RHYNCODES.

	Type.
Rhyncodes, Guen. Noct. ii. p. 394 (1852)	*phalæniformis.*

Rhyncodes phalæniformis, Guen. Noct. ii. p. 394 (1852).

Hab. **Cape Colony** (Dr. Smith); **Namaqualand.** *Exp.* 32 mill.

Genus ERIZADA.

	Type.
Erizada, Wlk. xxxii. 506 (1865)...	*semifervens.*

Sect. I. Forewing with the apex produced, the termen angled at vein 3; metathorax with sharp crest.

(1) Erizada sericealis, n. sp.

♀. Head and thorax greyish rufous irrorated with black; pectus and legs whitish; abdomen whitish dorsally tinged with rufous. Forewing with a silky gloss, ochreous suffused with red-brown and sparsely irrorated with black; a very oblique waved grey antemedial line; reniform with blackish outline, oblique, elliptical; postmedial line grey excurved from costa to vein 2 below which it is angled inwards; a subterminal series of black spots, angled inwards below costa and at vein 2 and outwards above vein 3. Hindwing pale yellow.

Hab. **Natal,** Durban (Leigh). *Exp.* 28 mill.

Sect. II. Forewing with the termen evenly curved; metathorax without crest.

(2) Erizada verna, n. sp.

♂. Antennæ ciliated; palpi with the third joint very long; wings with the termen rounded. Head white; the palpi and rings on antennæ rufous; thorax green; pectus and legs white, the fore tibiæ and tarsi rufous; abdomen ochreous dorsally banded with fuscous. Forewing very pale green, the costal edge rufous with a few black scales near it; ante- and post-medial white lines, the former oblique and slightly curved and edged with black on outer side, the latter slightly sinuous oblique from costa to vein 6 and edged with black on inner side; a black discoidal point; a subterminal series of black points ending at tornus; cilia rufous. Hindwing yellowish tinged with brown, the terminal area brown.

Hab. **Mashonaland,** Salisbury (Marshall). *Exp.* 20 mill. Type in B.M.

Sub-Family **HOMOPTERINÆ.**

A. Fore tibiæ spined at sides.
  a. Hindwing with the cell one-fourth length of wing .. .. *Nyctipao.*
  b. Hindwing with the cell one-third length of wing.
    a^1. Frons with tuft of hair .. .. *Calliodes.*
    b^1. Frons without tuft of hair.
      a^2. Hindwing ample, extending to well beyond end of abdomen .. .. *Cyligramma.*
      b^2. Hindwing moderate, not extending beyond abdomen.
        a^3. Palpi with the second joint reaching above vertex of head .. ..
        b^3. Palpi with the second joint not reaching vertex of head .. .. *Miniodes.*
B. Fore tibiæ not spined at sides
  a. Fore tibiæ with curved claw at extremity.. .. .. *Acanthonyx.*

Fore tibiæ without claw.
a^1. Abdomen smoothly scaled except the dorsal crests .. .. .. *Homoptera.*
b^1. Abdomen dorsally clothed with rough hair .. .. .. *Audea.*
c^1. Abdomen smoothly scaled and without crests.
a^2. Palpi with the third joint porrect .. .. *Chalciope.*
b^2. Palpi with the third joint upturned .. .. *Ophiusa.*

Genus NYCTIPAO.

	Type.
Nyctipao, Hübn. Verz. p. 271 (1827) ...	*crepuscularis.*
Patula, Guen. Noct. iii. p. 176 (1852) ...	*macrops.*

Sect. I. (*Patula*). Male with the costal half of hindwing aborted to form a fold turned over on the upper surface and containing a large glandular patch of flocculent hair; vein 4 running to the functional apex, 5 from middle of discocellulars, 6 to the fold, 7, 8 very minute to near base of costa.

(1) Nyctipao macrops, Linn. Syst. Nat. xii. iii. p. 225 (1766). Moore, Lep. Ceyl. iii. pl. 164, f. 5.
Patula walkeri, Butl. A.M.N.H. (4) xvi. p. 406 (1875).
Hab. **West Africa,** Gold Coast, Niger River; **British East Africa,** Masailand, Kikuyu, Kilima'njaro; **German East Africa,** Tanganyika; **British Central Africa,** Blantyre; **Mashonaland,** Salisbury (Marshall); **Natal,** Malvern (Marshall), Durban (Gueinzius, McKen); **Madagascar; India, Ceylon,** and **Burma.** *Exp.* 134–160 mill.

Genus CALLIODES.

	Type.
Calliodes, Guen. Noct. iii. p. 193 (1852) ...	*apollina.*
Maxula, Wlk. xxxiii. 1096 (1865)	*unistrigata.*
Pyramista, Kirby, A.M.N.H. (6) xviii. p. 391 (1896)	*capensis.*

Sect. I. Antennæ of male bipectinate with moderate branches ending in a long bristle.

(1) Calliodes pyrula, Hoppfr. Mon. Köngl. Akad. Wiss. Berl. 1857, p. 422, id. Peter's Reis. Mozamb. p. 435, pl. 28, ff. 10–11.
Spirama lucida, Feld. Reis. Nov. pl. 113, f. 8 (1874).
Hab. **Mozambique; N'Gamiland** (Lugard); **Natal,** Estcourt (Hutchinson). *Exp.* 38–48 mill.

Sect. II. Antennæ of male bipectinate with very short branches ending in a long bristle.

A. Both wings with waved lines on basal area .. .. *pretiosissima.*
B. Wings without waved lines on basal area .. .. *glaucescens.*

(2) Calliodes pretiosissima, Holl. Ent. xxv. Suppl. p. 94 (1892), id. P.U.S. Mus. xviii. p. 254, pl. 8, f. 2.
Calliodes rivuligera, Butl. P.Z.S. 1893, p. 679.
Hab. **East Africa**; **British Central Africa,** Zomba; **Delagoa Bay** (Mrs. Monteiro); **Natal,** Gadzima (Marshall). *Exp.* 42–54 mill.

(3) Calliodes glaucescens, Butl. P.Z.S. 1893, p. 680.
Hab. **British Central Africa,** Stevenson Road, Fwambo, Zomba; **Mashonaland,** Salisbury (Marshall). *Exp.* 62 mill.

Sect. III. (*Pyramista*). Antennæ of male serrate and fasciculate.

A. Antennæ of male with the shaft thickened at base.

(4) Calliodes pardus, Guen. Noct. iii. p. 205 (1852).
Hypopyra anteponens, Wlk. xiv. 1323 (1857).
Remigia venusta, Wlk. xxxiii. 1011 (1868).
Entomogramma panthera, Feld. Reis. Nov. pl. 115, f. 6 (1874).
Hab. **West Africa,** Sierra Leone, Niger; **British East Africa,** Athi Valley, Kilima'njaro; **British Central Africa,** Zomba; **Mashonaland,** Salisbury (Marshall); **Delagoa Bay** (Mrs. Monteiro); **Natal,** Malvern (Marshall), Durban (Gooch, Leigh); **Cap Colony** (Dr. Smith). *Exp.* 44–45 mill.

B. Antennæ of male with the shaft not thickened at base; abdomen with tufts of long hair at extremity.

(5) Calliodes capensis, Herr.-Schäff. Ausser. Eur. Schmett. ff. 121, 122 (1850).
Pyramista rufescens, Kirby, A.M.N.H. (6) xviii. p. 391 (1896).
Hab. **West Africa**; Niger; **British East Africa,** Wadelai, Kilima'njaro; **British Central Africa,** Zomba; **Delagoa Bay** (Junod); **Natal** (Gueinzius, Gooch), Malvern (Marshall). *Exp.* 80 mill.

Sect. IV. (*Maxilla*). Antennæ of male with bristles and cilia.

A. Wings orange-red below .. .. *africana.*
B. Wings pale below .. .. *pallida.*

(6) Calliodes africana, Kirby, A.M.N.H. (6) xviii. p. 392 (1896).
Hab. **British East Africa**; **N'Gamiland** (Lugard); **Matabeleland** (Oates). *Exp.* 52–58 mill.

(7) Calliodes pallida, n. sp.
♀. Head, tegulæ, and pectus rather pale rufous brown; thorax and abdomen ochreous white, the latter with pale brown segmental lines on dorsum. Forewing pale ochreous irrorated with brown; an indistinct pale rufous antemedial shade excurved below costa; a fuscous postmedial point on costa; a slightly incurved yellowish subterminal line ending at tornus. Hindwing pale ochreous, the inner area irrorated with brown; the terminal area tinged with pale rufous; a series of dark striæ just before termen. Under side ochreous with diffused rufous subterminal line on both wings.
Hab. **N'Gamiland** (Lugard). *Exp.* 50 mill. Type in B.M.

Auctorum.

Hypopyra inconspicua, Herr.-Schäff. Aus-serein Schmett. ff. 123, 124 ... ... Cape Colony.

Genus CYLIGRAMMA.

	Type.
Cyligramma, Boisd. Faun. Ent. Mad. Lép. p. 109 (1883)	*latona.*

A. Both wings with the subterminal dentate line angled inwards at and below middle.
  a. Both wings without yellowish irroration beyond the postmedial line.
    a^1. Both wings with the postmedial line indistinct, yellowish .. *limacina.*
    b^1. Both wings with the postmedial line broad, whitish .. .. *goudoti.*
  b. Both wings with yellowish irroration beyond the postmedial line .. .. *fluctuosa.*
B. Both wings with the subterminal line not angled inwards .. .. .. *latona.*

(1) Cyligramma limacina, Guér. Icon. R. Anim. Ins. pl. 89, f. 2 (1829).
Cyligramma argillosa, Guen. Noct. iii. p. 186 (1852).
Brujas bisignata, Wlk. xiv. (1858).
Hab. **West Africa,** Niger; **Senegal**; **Upper Egypt,** White Nile; **British East Africa**; **British Central Africa**; **Natal** (Gooch); **Madagascar**; **Mauritius.** *Exp.* 78–82 mill.

(2) Cyligramma goudoti, Guen. Noct. iii. p. 189 (1852).
Hab. **British East Africa,** Wadelai; **German East Africa,** Tanganyika; **British Central Africa,** Zomba; **Mashonaland,** Umtali (Marshall). *Exp.* 68 mill.

(3) Cyligramma fluctuosa, Drury, Ins. Exot. ii. 24, pl. 14, f. 1 (1770).
Cyligramma rudilinea, Wlk. xiv. 1311 (1857).
Hab. **British East Africa,** Masailand, Taru; **German East Africa,** Tanganyika; **British Central Africa,** Zomba; **Mashonaland,** Salisbury (Marshall). *Exp.* 76 mill.

(4) Cyligramma latona, Cram. Pap. Exot. i. p. 20, pl. 13 B (1779).
Hab. **West Africa,** Old Calabar; **Egypt,** Suakim, White Nile; **British East Africa; British Central Africa; N'Gamiland** (Lugard); **Transvaal** (Ross); **Delagoa Bay** (Kenrick); **Aden.** *Exp.* 74–86 mill.

Genus CEROCALA.

	Type.
Cerocala, Boisd. Index, Meth. p. 171 (1840)	*scapulosa.*

A. Forewing with the antemedial line incurved to inner margin .. *vermiculosa.*
B. Forewing with the antemedial line oblique, almost straight.. .. *contraria.*

(1) Cerocala vermiculosa, Herr.-Schäff. Ausser. Eur. Schmett. ff. 134, 135 (1850).
Hab. **N'Gamiland** (Lugard); **Cape Colony,** Knysna (Trimen), Eerste River (Trimen), Grahamstown. *Exp.* 50 mill.

(2) Cerocala contraria, Wlk. xxxiv. 990 (1865).
Bolina revulsa, Wllgrn. Öfv. Vet. Akad. Förh. 1875, p. 116.
Hab. **British East Africa,** Machakos, Kikuyu (Crawshay), Nairobi, Muani (Betton); **Transvaal; Natal,** Malvern (Marshall), Durban (Bowker); **Cape Colony,** Annshaw (Miss F. Barrett). *Exp.* 30–42 mill.

Genus MINIODES.

	Type.
Miniodes, Guen. Noct. iii. p. 119 (1852)... ...	*discolor.*

Miniodes discolor, Guen. Noct. iii. p. 119 (1852).
Hab. **West Africa,** Sierra Leone, Lagos, Niger, Gold Coast, Ashanti: **Natal,** Durban. *Exp.* 82–94 mill.

Genus ACANTHONYX, nov.

Type *A. marginalis.*

Proboscis fully developed; palpi short, oblique, the third joint porrect; frons rounded; antennæ of male bipectinate with moderate branches, simple towards apex; fore tibiæ with long curved spine on inner side at extremity; mid and hind tibiæ spined. Forewing with veins 3 and 5 from near angle of cell; 6 from upper angle; 9 from 10 anastomosing with 8 to form the areole; 11 from cell. Hindwing with veins 3, 4 from angle of cell; 5 from just above angle; 6, 7 from upper angle.

Acanthonyx marginalis, Wlk. xv. 1700 (1858).
Agrotis varians, Wllgrn. Wien. Ent. Mon. vii. p. 147 (1863).
,, *marginifera*, Wlk. xxxii. 706 (1865).
Hab. **N'Gamiland** (Lugard); **Cape Colony** (Dr. A. Smith).
Exp. ♂ 44, ♀ 48 mill.

Genus HOMOPTERA.

	Type.
Homoptera, Boisd. Icon. R. Anim. p. 522 (1829)	*lunata.*
Cortyta, Wlk. xiii. 1076 (1857)	*canescens.*

A. Forewing with the reniform large, diamond-shaped .. .. .. *complicata.*
B. Forewing with the reniform small, indistinct.
a. Hindwing with the subterminal line arising from the apex and oblique.
a^1. Forewing with the postmedial line angled outwards below costa.
a^3. Ground colour reddish brown .. .. *glaucinans.*
b^2. Ground colour grey .. .. *canescens.*
b^1. Forewing with the postmedial line inwardly oblique to costa .. .. *atrifusa.*
b. Hindwing with the subterminal line curved and waved .. .. *vetusta.*

(1) Homoptera complicata, Butl. A.M.N.H. (5) v. p. 386 (1880).
Hab. **Cape Colony,** Knysna (Newdigate); **Madagascar.** *Exp.* 66 mill.

(2) Homoptera glaucinans, Guen. Noct. iii. p. 6 (1852). Hmpsn. Ill. Het. B.M. ix. pl. 165, ff. 1, 7, 15. Larva Fawcett. Trans. Z.S. xv. vi. p. 318, pl. 49, ff. 22, 23 (1901).
Alamis mendax, Wlk. xiii. 1047 (1857).
Dugaria cilipes, Wlk. xiii. 1076 (1857).

Homoptera dilineosa, Wlk. xv. 1798 (1858).
,, *disjuncta*, Wlk. xxxiii. 885 (1865).
Hab. **West Africa,** Congo; **Soudan,** White Nile; **British East Africa,** Athi-ya-Mawe; **Natal** (Plant, Gueinzius, Burrows), Durban (Bowker, Leigh); **Formosa; India, Ceylon,** and **Burma; Java.** *Exp.* 36–42 mill.

(3) HOMOPTERA CANESCENS, Wlk. xiii. 1077 (1857).
Hab. **Natal,** Estcourt (Hutchinson); **Aden.** *Exp.* 36–44 mill.

(4) HOMOPTERA ATRIFUSA, n. sp.
♀. Head, thorax, and abdomen black mixed with grey and brown. Forewing grey suffused with black to beyond the postmedial line leaving some grey at base and beyond the antemedial line; traces of a waved subbasal line; the antemedial line black, trisinuate; four indistinct waved lines on medial area; the orbicular a minute black annulus; the reniform a black lunule with brown on its outer edge; the postmedial line black, minutely waved, oblique from costa to above vein 6 where it is angled, angled inwards in discal fold and outwards on vein 4, then strongly incurved; a blackish patch at apex; a dentate black subterminal line with short streaks on the veins before it and fuscous spot at vein 4. Hindwing grey suffused with black between end of cell and inner margin; an oblique white subterminal line from apex to tornus with two indistinct black lines before it; a dentate black subterminal line; both wings with fine white line at base of cilia. Under side white irrorated with black; both wings with subterminal series of small black lunules.
Hab. **N'Gamiland** (Lugard). *Exp.* 32 mill. Type in B.M.

(5) HOMOPTERA VETUSTA, Wlk. xxxiii. 875 (1865).
,, *scandatula*, Feld. Reis. Nov. pl. 111, f. 22 (1874).
Hab. **Soudan,** White Nile; **N'Gamiland** (Lugard); **Natal,** Estcourt (Hutchinson); **India.** *Exp.* 40 mill.

AUCTORUM.

Alamis deducta, Wlk. xiii. 1048 (1857).
Type lost... ... ... Natal.
Alamis caffraria, Möschl. Verh. Zool. bot. Ges. Wien. xxxiii. p. 301 (1884) ... ... Cape Colony.

Genus AUDEA.

	Type.
Audea, Wlk. xiii. 1135 (1857)	*bipunctata.*
Ulothrichopus, Wllgrn. Svensk. Acad. Handl. v. 4, p. 76 (1866)	*mesoleuca.*
Tachosa, Wlk. Tr. N.H. Soc. Glasg. i. p. 343 (1875)	*acronyctoides.*
Alura, Möschl. Verh. Zool. bot. Ges. Wien. xxxiii. p. 304 (1884)	*catocala.*

Sect. I. Antennæ of male with four small tile-like tufts of hair on upper side four-fifths from base; fore tibiæ with a group of spines on inner side at extremity.

(1) Audea tegulata, n. sp.

Head and thorax black and grey; the antennal tufts in male ochreous; abdomen grey irrorated with fuscous and tinged with fulvous towards base. Forewing grey strongly irrorated with black; small black subbasal, antemedial, and medial black spots on costa; an indistinct medial black line angled outwards below costa and incurved below vein 3; discocellulars black; the postmedial line crenulate, oblique from costa to vein 5 and below vein 3 slightly inwardly oblique and with a curved diffused line beyond it; a fine crenulate terminal line. Hindwing whitish tinged with pale fulvous; a terminal black-brown band narrowing from costa to vein 1.

Hab. **Mashonaland,** Salisbury (Marshall). *Exp.* ♂ 46, ♀ 50 mill.

Sect. II. Antennæ of male without tufts of hair; fore tibiæ without spines.

A. Hindwing yellow.
  a. Forewing with the postmedial line produced to very long teeth above veins 4, 5 .. .. *catocala.*
  b. Forewing with the postmedial line produced to short teeth above veins 4, 5.
    a^1. Forewing with the ground colour greenish grey .. .. *variegata.*
    b^1. Forewing with the ground colour black-brown .. .. *primulina.*

B. Hindwing white or whitish.
  a. Forewing with the postmedial line not retracted to origin of vein 2.
    a^1. Hindwing with the terminal band very broad and running up to base on inner area.. .. .. *mesoleuca.*
    b^1. Hindwing with the terminal band narrow at tornus.
      a^2. Hindwing with the inner area tinged with brown.
        a^3. Forewing without postmedial blackish patch on costa .. .. *tinctipennis.*
        b^3. Forewing with postmedial blackish patch on costa .. .. *humeralis.*
      b^2. Hindwing with the inner area pure white.

a^3. Forewing with a white spot on cilia below apex .. *bipunctata.*
b^3. Forewing without white spot on cilia below apex.
a^4. Hindwing with broad black terminal band.
a^5. Hindwing with the terminal black band extending to costa .. .. *melanoplaga.*
b^5. Hindwing with the terminal band restricted to medial part of termen .. .. *fatilega.*
a^4. Hindwing with the termen tinged with fuscous .. .. *fumata.*
b. Forewing with the postmedial line retracted to origin of vein 2.
a^1. Hindwing pure white, the terminal band narrow .. .. *retracta.*
b^1. Hindwing tinged with brown, the terminal band broad .. *nigristria.*

(2) Audea catocala, Feld. Reis. Nov. pl. 116, f. 2 (1874).
Alura caupona, Möschl. Verh. Zool. bot. Ges. Wien. xxxiii. p. 304, pl. xvi. f. 18 (1884).
Hab. **Transvaal** (Marshall); **Natal**, Estcourt (Hutchinson); **Cape Colony**, Queenstown (Bulger). *Exp.* 60 mill.

(3) Audea variegata, n. sp.
♀. Head and thorax red-brown mixed with dark brown and white; pectus whitish and grey; legs yellowish marked with dark brown, the tarsi banded with brown; abdomen orange, the extremity brownish. Forewing greenish grey irrorated with black; a short subbasal black line from costa and tufts of black hair below the cell and on inner margin; a waved antemedial black line with red-brown band on its inner side; reniform small, brownish; a black annulus below end of cell with waved line from it to inner margin; the postmedial line very oblique and somewhat sinuous from costa to vein 6, then very dentate, inwardly oblique and with less distinct similar line beyond it; a subterminal series of black and white dentate spots, those above veins 4, 5 extending to near termen; a series of small lunules just before termen. Hindwing orange-yellow with terminal black band narrowing towards tornus and leaving a yellow apical spot.
Hab. **Natal**, Victoria District (Gooch). *Exp.* 60 mill. Type in B.M.

(4) Audea primulina, n. sp.
Head and thorax dark brown mixed with black; pectus yellowish; legs yellowish and brown, the tarsi ringed with yellowish; abdomen dorsally orange, in male whitish towards base and brownish towards extremity, the ventral surface whitish. Forewing dark reddish brown, irrorated with black; a short waved subbasal line; the ante-

medial line double, angled outwards below costa and bent outwards to inner margin; a black discoidal lunule and annulus below end of cell, with a waved black line from it to inner margin; the postmedial line double, very oblique from costa to vein 6 then highly dentate and inwardly oblique; a subterminal series of dentate black spots with grey points on their inner side, a waved line just before termen. Hindwing pale yellow becoming orange-yellow on inner area; a black terminal band, sometimes not reaching costa, leaving a yellow apical patch.

Hab. **N'Gamiland** (Lugard); **Natal,** Estcourt (Hutchinson). *Exp.* 44 mill. Type in B.M.

(5)*Audea mesoleuca, Wlk. xv. 1812 (1858).

Ulotricopus tortuosus, Wllgrn. Svensk. Akad. Handl. v. 4, p. 76 (1866).

Hab. **Natal; Cape Colony.** *Exp.* 58 mill.

(6) Audea tinctipennis, n. sp.

♀. Head and thorax mixed black, brown, and white; pectus and legs whitish, the latter slightly marked with brown; abdomen dorsally brown, ventrally whitish. Forewing white so thickly irrorated with black that it becomes the predominant colour especially on inner area; a slight tuft of black hair below base of cell; the antemedial line indistinct waved; reniform indistinct; the postmedial line very oblique from costa to vein 6, then highly dentate and inwardly oblique; a highly dentate subterminal line with whitish patches in its dentitions. Hindwing white tinged with brown especially on costal and inner areas; a broad black terminal band narrowing towards tornus and leaving a whitish apical patch.

Hab. **Damaraland,** Kuisip; **N'Gamiland** (Lugard). *Exp.* 44 mill. Type in B.M.

(7) Audea humeralis, n. sp.

Head and thorax white mixed with brown; palpi, except at base, frons, and shoulders black; pectus and legs white, the latter marked with brown and the tarsi banded with black; abdomen whitish dorsally suffused with fuscous in male with ochreous in female, a lateral series of black points. Forewing white largely suffused and irrorated with fuscous brown leaving whitish patches on disk and below costa beyond postmedial line; an almost medial black line excurved below costa and bent outwards to inner margin with a

black patch before it on inner margin in female ; a black discoidal lunule; the postmedial line oblique from costa to vein 6, then excurved and dentate with traces of another line beyond it and a black patch at costa ; a series of black and grey lunules just before termen. Hindwing white tinged with brown especially on inner area ; a moderately broad terminal blackish band from apex to vein 2.

Hab. **Mashonaland,** Salisbury (Marshall) ; **N'Gamiland** (Lugard). *Exp.* 48 mill. Type in B.M.

(8) Audea bipunctata, Wlk. xii. 1135 (1857).

Phoberia fatua, Feld. Reis. Nov. pl. cxvi. f. 1 (1874).

Hab. **Natal** (Gueinzius, Burrows), Durban (Leigh). *Exp.* 56–62 mill.

(9) Audea melanoplaga, n. sp.

♂. Head black-brown ; thorax blackish with diffused whitish medial stripe ; pectus white ; legs black, the femora orange above, the tarsi ringed with white ; abdomen white dorsally suffused with fuscous especially towards extremity. Forewing with ridge of large scales below basal half of costa on upper side ; white strongly irrorated with fuscous ; the costal area black ; the terminal area fuscous ; an antemedial line from submedian fold to inner margin. Hindwing pure white with black terminal band broad at costa, narrowing to a point below vein 2.

♀. Thorax whiter, shoulders with distinct black patch. Forewing with antemedial and postmedial black patches on costa and antemedial patch on inner margin ; traces of a punctiform postmedial line.

Hab. **N'Gamiland** (Lugard) ; **Transvaal.** *Exp.* 44–46 mill. Type in B.M.

(10) Audea fatilega, Feld. Reis. Nov. pl. cxii. f. 9 (1874).

Hab. **British East Africa,** Athi-y-Mawe ; **Natal,** Estcourt (Hutchinson) ; **Cape Colony,** Queenstown (Trimen). *Exp.* 42–56 mill.

(11) Audea fumata, Wllgrn. Wien. Ent. Mon. iv. p. 171 (1860).

Tegulæ of male with tufts of ochreous scales at extremity ; forewing with the cell clothed with ochreous scales on under side.

Hab. **Natal,** Bushman's River (Monkhouse), Estcourt (Hutchinson) ; **Cape Colony,** Transkei (Miss F. Barrett). *Exp.* 48 mill.

(12) Audea retracta, n. sp.

Head and thorax brown mixed with grey; abdomen whitish tinged with ochreous and slightly irrorated with fuscous. Forewing grey thickly irrorated with brown and suffused with brown and fuscous; the antemedial line angled outwards on median nervure and above inner margin and inwards on vein 1; a diffused fuscous mark on middle of costa; the postmedial line minutely sinuous, oblique from costa to below vein 6, at vein 3 retracted to origin of vein 2 and excurved again above inner margin, a diffused fuscous band beyond it with dentate outer edge; a series of slight streaks in interspaces of terminal area; cilia fuscous intersected with grey. Hindwing pure white; the costal area, termen, and base of cilia brown from apex to vein 1.

Hab. **Natal,** Estcourt (Hutchinson); **Cape Colony,** Transkei (Miss F. Barrett). *Exp.* 36 mill. Type in B.M.

(13) Audea nigristria, n. sp.

♀. Dull brown; palpi, lower part of frons and legs blackish. Forewing with blackish mark at base of costa; an obliquely curved sinuous subbasal line from costa to submedian fold; the antemedial line oblique and slightly sinuous from costa to submedian fold then strongly incurved; the postmedial line bent outwards below costa, strongly excurved to vein 3, then retracted to origin of vein 2 where it is conjoined to a black streak on terminal part of median nervure, then obliquely curved to inner margin; a black line on termen with a series of short streaks in the interspaces before it. Hindwing whitish tinged with brown, the terminal area broadly and diffusedly fuscous; cilia white.

Hab. **Cape Colony,** Transkei (Miss F. Barrett). *Exp.* 42 mill.

Genus CHALCIOPE.

	Type.
Chalciope, Hübn. Verz. p. 268 (1827)... ...	*cephise.*
Pseudophia, Guen. Noct. iii. p. 234 (1852)...	*illunaris.*
Grammodes, Guen. Noct. iii. p. 275 (1852)...	*geometrica.*
Trigonodes, Guen. Noct. iii. p. 281 (1852) ...	*hyppasia.*
Remigia, Guen. Noct. iii. p. 312 (1852) ...	*frugalis.*

Sect. I. Antennæ of male bipectinate.

(1) Chalciope carnicolor, n. sp.

♂. Head and tegulæ rufous; antennæ brownish, white towards base; thorax and abdomen ochreous yellow. Forewing ochreous

yellow tinged with rufous; traces of a subbasal line; the antemedial line angled in cell, then indistinct and with black points on median nervure and vein 1; an indistinct medial line angled at median nervure; reniform black-brown, rather wedge-shaped; the postmedial line pale yellow with black spot at costa and series of black points on its inner edge, excurved from costa to vein 4, then incurved, angled outwards in submedian fold and to inner margin; an almost straight white subterminal line ending at tornus, its inner edge defined by rufous its outer by grey and black striæ on the veins; a series of minute points on the veins before termen and some striæ on termen. Hindwing ochreous white, the terminal area tinged with rufous; traces of waved medial and postmedial dark lines and of a pale straight subterminal line: subterminal and terminal series of dark striæ, the termen produced to a point at vein 4 with a brown spot on it.

Ab. 1. Forewing with all the markings less distinct especially the reniform and postmedial line; hindwing with the brown spot on termen almost obsolete.

Hab. **Damaraland; Matebeleland** (Oates). *Exp.* 50 mill. Type in B.M.

Sect. II. Antennæ of male ciliated.

A. Mid and hind tibiæ of male fringed with long hair.
  a. (*Remigia*) Hind tarsi of male fringed with long hair.
    a^1. Forewing with annulus below the reniform .. .. *repanda.*
    b^1. Forewing without annulus below the reniform .. .. *frugalis.*

(2) Chalciope repanda, Fabr. Ent. Syst. iii. 2, p. 49 (1792).
Remigia latipes, Guen. Noct. iii. p. 314 (1852).
„ *conveniens*, Wlk. xiv. 1507 (1857).
Hab. **West Indies; South America; West Africa,** Sierra Leone, Old Calabar, Nigeria, Congo; **Soudan,** White Nile; **British East Africa,** Kampala, Kikuyu; **British Central Africa,** Zomba, Chinde; **Mashonaland,** Salisbury (Marshall); **Natal,** Victoria District (Gooch), Durban (Leigh); **Cape Colony** (Dr. Smith); **Aden.** *Exp.* 40–50 mill.

(3) Chalciope frugalis, Fabr. Syst. Ent. vi. p. 601 (1775).
Hab. **West Africa,** Old Calabar, Nigeria, Congo; **British Central Africa,** Matopo; **Natal,** Victoria District (Gooch), Durban (Leigh); **Madagascar; Aden; India, Ceylon,** and **Burma; Nicobars; Formosa; Loochoo; Borneo; Java; Australia; Pacific Groups.** *Exp.* 36–50 mill.

b. (*Chalciope*) Hind tarsi of male not fringed with hair.
*a*¹. Forewing without triangular black patches.
*a*². Forewing with the postmedial line retracted from below vein 2 up to median nervure.
*a*³. Forewing with the reniform black bidentate .. .. *judicans*.
*b*³. Forewing with the reniform not black.
*a*⁴. Forewing with the postmedial line strongly angled inwards in discal fold .. .. *mutuaria*.
*b*⁴. Forewing with the postmedial line not angled inwards in discal fold .. .. *undata*.
*b*². Forewing with the postmedial line not retracted to median nervure .. .. *calida*.
*b*¹. Forewing with two large triangular black patches .. .. .. *hyppasia*.

(4) Chalciope judicans, Wlk. xv. 1831 (1858).
Grammodes insulsa, Wllgrn. Wien. Ent. Mon. iv. p. 173 (1860).
Hab. **British East Africa**, Kikuyu; **British Central Africa**, Zomba; **Mashonaland**, Salisbury (Marshall); **Natal**, Karkloof (Marshall), Victoria District (Gooch). *Exp.* 40–46 mill.

(5) Chalciope mutuaria, Wlk. xiv. 1506 (1857).
Remigia torpida, Wlk. xxxiii. 1013 (1865).
Hab. **British East Africa**, Machakos, Kikuyu; **British Central Africa**, Zomba; **Mashonaland**, Salisbury (Marshall); **Natal**, Estcourt (Hutchinson), Karkloof (Marshall), Victoria District (Gooch); **Cape Colony** (Dr. A. Smith). *Exp.* 40–42 mill.

(6) Chalciope undata, Fabr. Syst. Ent. p. 600 (1775).
Noctua archesia, Cram. Pap. Exot. iii. pl. 273, F.G. (1779).
Remigia pellita, Guen. Noct. iii. p. 319 (1852).
,, *jugalis*, Wlk. xiv. 1505 (1857).
Hab. **West Africa**, Sierra Leone, Ashanti, Cameroons, Congo; **British East Africa**, Wadelai, Munisu; **British Central Africa**, Chinde, Zomba; **Mashonaland**, Salisbury (Marshall); **Natal**, Durban (Leigh); **Mauritius**; **Siberia**; **Japan**; **China**; **India**, **Ceylon**, and **Burma**; **Andamans**; **Nicobars**; **Java**; **North Guinea**; **Pacific Groups**. *Exp.* 42–54 mill.

(7) Chalciope calida, n. sp.
♂. Head, thorax, and abdomen fuscous brown mixed with grey; anal tuft ochreous. Forewing reddish brown with a purplish tinge and irrorated with black; an indistinct subbasal line from costa to submedian fold; the antemedial dark line angled outwards on subcostal and median nervures and vein 1; reniform dark brown, small,

constricted at middle; the postmedial line with a less distinct line before it and a dark spot at costa, bent outwards below costa, then crenulate, excurved to vein 4, then incurved; the subterminal line with pale points at the veins, some rufous and fuscous suffusion before it, incurved below vein 5 and with a dark spot between it and middle of termen; a crenulate dark terminal line. Hindwing fuscous brown with indistinct dark medial line and pale subterminal line towards tornus. Under side greyish with curved postmedial line with ochreous patch beyond it at costa; the terminal area fuscous.

Hab. **Abyssinia**; **British East Africa,** Wadelai (Emin Pasha); **Natal,** Durban (Barker). *Exp.* 32 mill.

(8) Chalciope hyppasia, Cram. Pap. Exot. iii. pl. 250 E. (1779).
Trigonodes acutata, Guen. Noct. iii. p. 283 (1852).
Chalciope mahura, Feld. Reis. Nov. pl. 117, f. 13 (1874).
Hab. **West Africa**; **Soudan**; **Abyssinia**; **British East Africa**; **British Central Africa**; **Delagoa Bay** (Junot); **Cape Colony** (Dr. Smith); **Madagascar**; **Mauritius**; **Aden**; **China**; **Formosa**; **India, Ceylon,** and **Burma**; **Java**; **Australasia.** *Exp.* 46 mill.

B. Mid and hind tibiæ of male not fringed with long hair.
  a. Forewing with large triangular black patch defined by white lines .. .. *delta.*
  b. Forewing without white-defined triangle.
    a^1. Forewing with pale erect antemedial band.
      a^2. Forewing with the postmedial line acutely angled outwards below apex .. .. *erecta.*
      b^2. Forewing with the postmedial line slightly excurved below costa.
        a^3. Hindwing with the ground colour orange .. .. *euclidioides.*
        b^3. Hindwing with the ground colour dark.
          a^4. Forewing with the postmedial line angled inwards at middle .. .. *stolida.*
          b^4. Forewing with the postmedial line not angled inwards at middle .. .. *geometrica.*
    b^1. Forewing without pale antemedial band.
      a^2. Forewing with wedge-shaped black patch on inner area .. .. *obstans.*
      b^2. Forewing without wedge-shaped black patch on inner area.
        a^3. Forewing with the postmedial band produced to near termen at middle .. .. *rivulata.*
        b^3. Forewing with the postmedial band not produced to near termen at middle.
          a^4. Forewing with the postmedial line angled outwards at middle.
            a^5. Hindwing with the ground colour orange *metaxantha.*
            b^5. Hindwing with the ground colour greyish.
              a^6. Forewing with the medial area rufous *balnearia.*

b^6. Forewing with the medial area grey, fuscous on inner side of postmedial line .. .. *harmonica.*

b^4. Forewing with the postmedial line excurved below costa and not angled at middle.. .. .. *moderata.*

(9) Chalciope delta, Boisd. Faun. Ent. Mad. Lép. p. 105, pl. 13, f. 1 (1833).

Hab. **German East Africa,** Tanga; **N'Gamiland** (Lugard); **Cape Colony,** Plettenburg Bay; **Madagascar; Mauritius.** *Exp.* 38 mill.

(10) Chalciope erecta, n. sp.

♀. Head and thorax dark brown; antennæ with the shaft white above; abdomen fuscous brown. Forewing black-brown to the postmedial line, the costa rather paler; a narrow erect white antemedial band not reaching costa; the postmedial line whitish, very oblique from costa to an acute angle at vein 6, where it is nearly met by a curved dark mark from apex diffused on upper side, the line oliquely incurved below vein 6; the terminal area greyer brown; a crenulate dark terminal line. Hindwing fuscous brown; the under side greyer with slight discoidal point and minutely waved postmedial line.

Hab. **Natal,** Northdene. *Exp.* 38 mill. Type in B.M.

(11) Chalciope euclidioides, Guen. Noct. iii. p. 276 (1852). Herr.-Schäff. Aussereur Schmett. ff. 137–138.

Euclidia dubitans, Wlk. xiv. 1463 (1857).

Hab. **Transvaal** (Ross); **Natal,** Estcourt (Hutchinson); **Cape Colony,** Caffraria, Albany. *Exp.* 36 mill.

(12) Chalciope stolida, Fabr. Syst. Ent. p. 599 (1775).

Hab. **Europe; Syria; West Africa,** Sierra Leone, Congo; **Soudan,** White Nile; **Abyssinia; British East Africa,** Port Ogowe, Machakos, Kilima'njaro; **British Central Africa,** Chiromo; **Damaraland,** Ovampo Lakes (Erichsson); **N'Gamiland** (Lugard); **Natal,** Victoria District (Gooch); **Cape Colony** (Dr. Smith); **Aden; India.** *Exp.* 30–40 mill.

(13) Chalciope geometrica, Fabr. Syst. Ent. p. 599 (1775).

Grammodes congenita, Wlk. xiv. 1443 (1857).

Hab. **Europe; West Africa,** Ashanti, Old Calabar, Congo; **British East Africa,** Wadelai, Kikuyu; **British Central Africa,**

Zomba; **Mashonaland,** Salisbury (Marshall); **N'Gamiland** (Lugard); **Natal,** Estcourt (Hutchinson); Victoria District (Gooch); **Cape Colony,** Plettenberg Bay (Trimen); **China; Formosa; India; Ceylon; Java; Australia.** *Exp.* 26–45 mill.

(14) Chalciope obstans, Wlk. xiv. 1450 (1857).

Hab. **Natal,** Estcourt (Hutchinson), Victoria District (Gooch); **Cape Colony** (Dr. Smith), Capetown. *Exp.* 36–42 mill.

(15) Chalciope rivulata, n. sp.

Head and thorax grey, the head, tegulæ, and crest on prothorax with brown lines; abdomen whitish. Forewing whitish irrorated with pale purplish brown; the costa irrorated with black, the area below it and the cell finely streaked with brown, the streak on median nervure expanding beyond angle of cell and edged with black; a black point in middle of cell; an oblique brown mark from below end of cell to inner margin before middle, its lower side edged with black and angled, the area below it brown, then ochreous towards inner margin; the outer edge of the grey area has four brown lines before it between vein 6 and 1 and runs from apex very obliquely and sinuously to vein 5, at vein 4 is produced to a long tooth towards termen, then is strongly incurved and excurved above inner margin; the area beyond it grey-brown, ochreous towards termen with two fine brown lines following the outline of grey area but dentate at veins 4 and 3 and with a series of dentate black marks beyond them; a subapical black point, three fine lines on termen and one through the cilia. Hindwing with the basal half whitish, the terminal half fuscous brown; cilia white; the under side with double discoidal black point; two indistinct waved post-medial lines and a series of black points just before termen.

Hab. **British East Africa,** Kikuyu (Crawshay); **Natal,** Weenen; **Cape Colony,** Transkei (Miss F. Barrett). *Exp.* 36 mill.

(16) Chalciope metaxantha, n. sp.

♂. Head and thorax ochreous white irrorated with dark brown; tarsi black ringed with white; abdomen ochreous. Forewing ochreous white irrorated with black; the basal area suffused with brown; a waved black subbasal line from costa to submedian fold; a waved black antemedial line obtusely angled below the cell; the medial area tinged with brown towards costa and inner margin and

with an indistinct minutely waved medial line strongly excurved in cell; a waved black postmedial line strongly angled inwards in submedian fold, a diffused sinuous brown line beyond it followed by a grey band before the indistinct waved subterminal line; the terminal area brown with a crenulate terminal line. Hindwing orange with postmedial dark line towards tornus; the termen tinged with brown and with a waved dark line. Under side orange with some fuscous suffusion at apex of each wing.

Hab. **Damaraland: Cape Colony.** *Exp.* 38 mill. Type in B.M.

(17) Chalciope balnearia, Dist. A.M.N.H. (7) i. p. 228 (1898).

Hab. **Mashonaland,** Salisbury (Marshall); **Transvaal.** *Exp.* 40 mill.

(18) Chalciope harmonica, n. sp.

♂. Head and thorax grey tinged with pale yellow-brown; abdomen pale yellow-brown. Forewing grey; a double waved subbasal black line from costa to submedian fold; the basal area suffused with yellow brown deepening towards the minutely dentate black antemedial line; the medial area purple-grey becoming black-brown towards the waved black postmedial line which is acutely angled outwards at vein 4, the area beyond it tinged with ochreous to the dentate grey subterminal line which has a brown patch beyond it at apex; a series of black points before termen. Hindwing whitish, the basal area tinged with pale brown; an oblique slightly sinuous medial blackish line defined by white on outer side; the terminal area suffused with black; an indistinct pale postmedial line; the termen whitish between vein 5 and tornus; a crenulate black terminal line becoming a thicker straight line towards tornus; the under side grey irrorated with brown; a discoidal point, minutely dentate postmedial line, diffused subterminal line, and series of points before termen.

Hab. **N'Gamiland** (Lugard). *Exp.* 38 mill. Type in B.M.

(19) Chalciope moderata, Wllgrn. Wien. Ent. Mon. iv. p. 174 (1860).

Hab. **West Africa,** Sierra Leone, Nigeria; **Soudan,** White Nile; **East Africa; Mashonaland,** Salisbury (Marshall); **N'Gamiland** (Lugard); **Damaraland; Ovampoland; Delagoa Bay** (Mrs. Monteiro); **Cape Colony,** Annshaw (Miss F. Barrett), Dordrecht (Graham). *Exp.* 34–40 mill.

AUCTORUM.

Fodina hypercompoides, Wlk. xxxiii. 971 (1865). Type lost ... ... Zambesi.
Fodina arctioides, Wlk. xxxiii. 971 (1865). Type lost ... ... Natal.
Grammodes tædia, Feld. Reis. Nov. pl. 115, f. 1 (1874). Type lost... ... ... Natal.

GENUS OPHIUSA.

	Type.
Ophiusa, Ochs. Eur. Schmett. iv. p. 93 (1816)	*algira.*
Epistona, Möschl. Verh. Zool. bot. Ges. Wien. xxxiii. p. 302 (1883)	*limula.*
Dermaleipa, Saalm. Lep. Madag. p. 460 (1891)	*parallepipeda.*

Sect. I. Mid tibiæ of male dilated with a fold and fringe of large scales.

A. Hind tarsi of male with the first joint fringed with hair above.
  a. Hindwing orange .. .. *croceipennis*.
  b. Hindwing not orange.
    a^1. Hindwing with white spots on termen.
      a^2. Hindwing with more or less developed white medial band or spots.
        a^3. Forewing with the antemedial line oblique, waved.
          a^4. Forewing greyish with prominent black ante- and post-medial lines .. .. *catella.*
          b^4. Forewing reddish brown with the lines indistinct.. .. .. *mercatoria.*
        b^3. Forewing with the antemedial line incurved, not waved.
          a^4. Hindwing with prominent white spots at and below apex and on cilia below middle *lienardi.*
          b^4. Hindwing with white spot at apex and some grey on middle of termen.. .. .. *echo.*
      b^2. Hindwing without medial band or spots .. .. .. *illustrata.*
    b^1. Hindwing without white spots on termen.
      a^2. Forewing with the antemedial line incurved .. .. *indeterminata.*
      b^2. Forewing with the antemedial line outwardly oblique.
        a^3. Forewing with the postmedial line not dentate.. *faber.*
        b^3. Forewing with the postmedial line dentate.
          a^4. Hindwing with series of black points before termen.
            a^5. Forewing with the medial line bent inwards to costa .. .. *boris.*
            b^5. Forewing with the medial line not bent inwards to costa.. .. .. *sordida.*
          b^4. Hindwing without black points before termen.

a^5. Forewing without large reniform stigma open and extending to costa .. .. .. *limbata.*
b^5. Forewing with large reniform stigma open and extending to costa.
a^6. Forewing grey irrorated with dark brown .. .. *limula.*
b^6. Forewing reddish brown .. .. .. *nocturnia.*
a^2. Forewing with the antemedial line inwardly obligue *proxima.*

(1) Ophiusa croceipennis, Wlk. xiii. 1377 (1857).
Hab. **British East Africa,** Kilima'njaro ; **British Central Africa** ; Zomba ; **Natal,** Durban (Gueinzius, Bowker). *Exp.* 56–66 mill.

(2) Ophiusa catella, Guen. Noct. iii. p. 247 (1852).
Hab. **West Africa,** Congo ; **Senegal** ; **Upper Egypt,** White Nile ; **Erithrea,** Massowah ; **Abyssinia** ; **Sokotra** ; **British East Africa** ; **Mashonaland,** Salisbury (Marshall) ; **N'Gamiland** (Lugard) ; **Natal,** Gadzima (Marshall) ; **Rodriguez** ; **Aden.** *Exp.* 52–62 mill.

(3) Ophiusa mercatoria, Fabr. Ent. Syst. iii. p. 62 (1775).
Hab. **Portuguese East Africa,** Pungwe River (Marshall) ; **India** ; **Ceylon** ; **Java.** *Exp.* 60 mill.

(4) Ophiusa lienardi, Boisd. Faun. Ent. Mad. Lép. p. 102, pl. 15, f. 5 (1833).
Achæa chamæleon, Guen. Noct. iii. p. 249 (1852).
„ *spectatura,* Wlk. xiv. 1393 (1858).
Hab. **West Africa,** Sierra Leone, Ashanti, Nigeria, Congo ; **Upper Egypt,** White Nile ; **British East Africa** ; **Natal** (Gueinzius), Verulam (Trimen), Estcourt (Hutchinson), Durban (Leigh) ; **Cape Colony** (Dr. Smith), Grahamstown. *Exp.* 50–64 mill.

(5) Ophiusa echo, Wlk. xiv. 1374 (1858).
Hab. **West Africa,** Sierra Leone ; **Mashonaland,** Umtali (Marshall) ; **Natal,** Durban (Leigh). *Exp.* 66–72 mill.

(6) Ophiusa illustrata, Wlk. xiv. 1392 (1857).
Hab. **West Africa,** Sierra Leone ; **Natal,** Durban (Leigh). *Exp.* 68 mill.

(7) Ophiusa indeterminata, Wlk. xxxiii. 955 (1865).
Ophisma demta, Möschl. Verh. Zool. bot. Ges. Wien. xxxiii. p. 305, pl. xvi. f. 20 (1883).
Hab. **Natal,** Estcourt (Hutchinson), Durban (Gooch, Leigh); **Cape Colony,** Caffraria. *Exp.* 56–58 mill.

(8) Ophiusa faber, Holl. Psyche, vii. p. 69 (1894).
Hab. **West Africa,** Sierra Leone, Old Calabar; **Natal,** Durban (Leigh, Barker); **Madagascar.** *Exp.* 62–66 mill.

(9) Ophiusa boris, Geyer. Zütr. Ex. Schmett. ff. 973–4 (1827).
Ophisma oblita, Wlk. xiv. 1375 (1858).
,, *senior*, Wlk. xiv. 1376 (1858).
,, *mundissima*, Wlk. xiv. 1376 (1858).
Hab. **West Africa,** Sierra Leone, Gold Coast, Old Calabar, Nigeria; **Natal** (Gueinzius). *Exp.* 50–60 mill.

(10) Ophiusa sordida, Wlk. xxxiii. 955 (1865).
Ophisma pretoriæ, Dist. Naturalist in Transvaal, p. 239, pl. ii. f. 7 (1892).
Hab. **Transvaal,** Pretoria (Ayres, Rose); **Cape Colony,** Transkei (Miss F. Barrett). *Exp.* 60 mill.

(11) Ophiusa limbata, Feld. Reis. Nov. pl. 116, f. 6 (1874).
Hab. **West Africa,** Congo; **Mashonaland,** Salisbury (Marshall); **Delagoa Bay** (Junod); **Natal** (Gueinzius); **Madagascar.** *Exp.* 60–66 mill.

(12) Ophiusa limula, Möschl. Verh. Zool. bot. Ges. Wien. xxxiii. p. 303, pl. xvi. f. 17 (1883).
Hab. **Cape Colony,** Plettenberg Bay (Newdigate). *Exp.* 56 mill.

(13) Ophiusa nocturnia, n. sp.
Head and thorax dark red-brown; pectus, legs, and abdomen greyish fuscous. Forewing dark red-brown or greyish brown with the markings more distinct; a waved blackish subbasal line from costa to submedian fold; an oblique waved antemedial line angled outwards below costa; the orbicular represented by a black point; the reniform very large with indistinct ochreous and blackish lunule at centre and defined by a waved black line, open towards costa and extending up to it, its outer edge angled, and extending down to vein

2; the postmedial line dentate, oblique from costa to vein 6 where it is angled, then inwardly oblique; the subterminal line indistinct waved, angled outwards at vein 7 and excurved at middle and with a darker patch before it on costa extending down to vein 6; a series of black points just before termen. Hindwing fuscous brown, paler towards base.

Ab. 1. Forewing with some reddish ochreous on each side of antemedial line and beyond the postmedial line where it is developed into a large patch on costa before the subterminal line.

Hab. **Transvaal** (Marshall); **Cape Colony,** Annshaw, Transkei (Miss F. Barrett). *Exp.* 56 mill. Type in B.M.

(14) Ophiusa proxima, n. sp.

♀. Head and thorax dark red-brown slightly irrorated with white; abdomen fuscous brown. Forewing purplish grey; the basal area suffused with cupreous red-brown; an indistinct subbasal line from costa to submedian fold; the antemedial line straight, inwardly oblique; the area before the postmedial line suffused with cupreous red-brown leaving a purple-grey band beyond the antemedial line; two indistinct discoidal points; a dentate medial line excurved beyond cell; the postmedial line oblique from costa to vein 6 where it is acutely angled outwards, then minutely waved and inwardly oblique, its angle met by an oblique streak from apex; some brown suffusion beyond it before the indistinct double dentate subterminal line; a series of black points just before termen. Hindwing dark brown with indistinct medial line; a greyish subterminal line near tornus and some grey on termen between vein 5 and tornus; the under side greyer with two minutely waved curved medial lines.

Hab. **Natal,** Victoria District (Gooch). *Exp.* 50 mill. Type in B.M.

B. Hind tarsi with the first joint not fringed with hair above.
- *a*. Hindwing with the apical area orange .. .. *bryoxantha.*
- *b*. Hindwing with apical white patch .. .. *mormoides.*
- *c*. Hindwing without yellow or white at apex.
  - a^1. Hindwing with medial white band.. .. .. *algira.*
  - b^1. Hindwing without medial white band.
    - a^2. Forewing with the antemedial line curved.
      - a^3. Forewing with the postmedial line incurved to near angle of cell at middle .. .. *angularis.*
      - b^3. Forewing with the postmedial line slightly incurved at middle .. .. *derogans.*
    - b^2. Forewing with the antemedial line almost straight .. *erectata.*
    - c^2. Forewing with the antemedial line waved .. .. .. *palumbiodes.*

(15) Ophiusa bryoxantha, n. sp.

♀. Head and thorax red-brown mixed with white; abdomen reddish brown. Forewing red-brown suffused with sap-green; five waved dark lines before the medial almost straight line; black points at angles of cell; two waved lines just beyond the cell excurved from below costa to vein 4, then incurved; the postmedial line oblique from costa to vein 7 where it is acutely angled, then incurved and highly dentate; a rufous patch on apical part of costa with a white line between it and postmedial line and silvery blue suffusion on its outer edge; an indistinct crenulate brown subterminal line defined by fuscous suffusion; a series of black points just before termen. Hindwing black-brown with large orange patch on apical half of costa, on termen extending to vein 5, the rest of terminal area reddish brown with waved line before termen. Under side of forewing with broad orange band from below middle of costa to tornus; the costa and apex irrorated with white; hindwing yellowish with a purplish tinge and thickly irrorated with black and white, two dark medial lines, the inner curved, the outer sinuous and waved, a yellowish waved subterminal line incurved below costa, a series of black points before termen.

Ab. 1. Forewing red-brown; the markings very indistinct; a somewhat oblique white medial band expanding towards costa and with the narrow dark reniform centred with white on it.

Hab. **Delagoa Bay** (Mrs. Monteiro); **Natal.** *Exp.* 70 mill. Type in B.M.

(16) Ophiusa mormoides, Wlk. xiv. 1393 (1858).
Achæa mania, Feld. Reis. Nov. pl. 116, f. 16 (1874).
Hab. **West Africa,** Old Calabar; **Natal,** Durban (Gooch, Leigh). *Exp.* 64–74 mill.

(17) Ophiusa algira, Linn. Syst. Nat. i. p. 836 (1766).
,, *properans*, Wlk. xiv. 1426 (1858).
Hab. **Europe; West Africa,** Sierra Leone, Niger, Congo; **British East Africa; Natal,** Victoria District (Gooch), Durban (Leigh); **Cape Colony** (Dr. Smith), Grahamstown (Tuck); **Mauritius; Aden; Japan; China; India; Ceylon; Burma.** *Exp.* 42–46 mill.

(18) Ophiusa angularis, Boisd. Faune. Ent. Madag. Lép. p. 103, pl. 13, f. 2 (1833).
Hab. **British East Africa,** Wadelai, Voi; **Natal** (Gooch); **Madagascar; Mauritius.** *Exp.* 40 mill.

(19) Ophiusa derogans, Wlk. xv. 1832 (1858).

Hab. **British Central Africa,** Zomba; **Natal** (Gooch); **Cape Colony** (Drège). *Exp.* 38 mill.

(20) Ophiusa erectata, n. sp.

Head and thorax purplish brown; abdomen fuscous brown. Forewing brownish strongly suffused with purple; a dark subbasal line from costa to submedian fold; some dark brown suffusion before the antemedial line which is nearly straight and erect; a slight discoidal lunule; an indistinct waved medial line excurved beyond the cell, then incurved and with dark suffusion between it and the postmedial line which is produced to an acute angle on vein 7, then strongly incurved and slightly waved; an indistinct pale waved subterminal line, angled inwards below costa and outwards at vein 7 and then strongly defined by dark suffusion on inner side; a series of points just before termen and crenulate terminal line. Hindwing fuscous brown with indistinct pale curved subterminal line bent outwards to tornus; the under side pale with discoidal point; two indistinct waved medial lines and a diffused subterminal line.

Hab. **British East Africa,** M'gana (Betton), Muthambi (Crawshay); **Transvaal,** Lydenberg, *Exp.* 36 mill.

(21) Ophiusa palumbiodes, n. sp.

Head, thorax, and abdomen grey-brown irrorated with a few black scales. Forewing grey-brown suffused with purple-grey to the postmedial line and irrorated with black scales; a waved brownish subbasal line from costa to submedian fold; a waved antemedial line; a slight dark discoidal lunule; the postmedial line indistinct, minutely waved, very oblique, arising from a black spot on costa, with some black points on the veins and with a nearly straight line beyond it arising from near apex; faint traces of a waved subterminal line; a series of black points before termen. Hindwing grey-brown with a slight purplish gloss; a slightly sinuous dark medial line; an indistinct waved postmedial line with some small white lunules on it towards inner margin with a yellowish ferruginous suffused patch beyond them; a series of black points before termen. Under side of both wings grey irrorated with black; a greyish-centred discoidal spot; a waved postmedial line with a straight line beyond it on forewing, a dentate line on hindwing.

Hab. **Natal,** Durban (Gooch, Leigh). *Exp.* 40–46 mill. Type in B.M.

Sect. II. Mid tibiæ of male not dilated.

A. Fore femora of male dilated with fringe of long hair and large scales.
a. (*Dermaleipa*) Hindwing of male with fringes of long hair on inner margin on upper side.

(22) Ophiusa ignicans, n. sp.

♂. Head and thorax red-brown irrorated with white; pectus and mid and hind femora and tibiæ with scarlet hair; abdomen fuscous brown, the anal tuft and ventral surface fiery red. Forewing red-brown with a purplish tinge and irrorated with black and with fine pale striæ; a pale oblique subbasal line from costa to submedian fold; a pale rufous-edged very oblique line from costa before middle to middle of inner margin; reniform defined by black; incurved postmedial and subterminal lines, the latter with black points on its outer edge. Hindwing fiery red; the inner area brown extending into the cell and as a subterminal band to vein 5. Under side fiery red, forewing with a dark discoidal lunule, the apical area irrorated with black; hindwing irrorated with black.

♀. Hindwing yellow tinged with scarlet towards termen.

Hab. **West Africa,** Accra (Sir G. Carter), Gaboon (Dobree); **Natal** (Miller). *Exp.* 58–64 mill. Type in B.M.

b. Under side of hindwing of male with the basal and inner areas clothed with rough androconia, the upper side with rough hair.
a^1. Forewing pale yellow-green with brown terminal band .. .. *tirrhaca.*
b^1. Forewing blue-grey .. .. *dianaris.*
c^1. Forewing pale brownish .. .. *umbrilinea.*

(23) Ophiusa tirrhaca, Cram. Pap. Exot. ii. pl. 172 E. (1779).
Ophiodes hottentota, Guen. Noct. iii. p. 229 (1852).
Hab. **Europe; Sokotra; Mashonaland,** Salisbury (Marshall); **Cape Colony; China; India.** *Exp.* 64–80 mill.

(24) Ophiusa dianaris, Guen. Noct. iii. p. 232 (1852).
Pandesma tempica, Möschl. Verh. Zool. bot. Ges. Wien. xxxiii. p. 300, pl. xvi. f. 16 (1883).
Hab. **Abyssinia; Sokotra; Natal,** Estcourt (Hutchinson); **Cape Colony,** Knysna. *Exp.* 60 mill.

(25) Ophius umbrilinea, n. sp.

♂. Head and thorax pale red-brown; the hair on pectus and legs pale yellow; abdomen pale yellow. Forewing pale brownish

tinged and irrorated with dark brown; the antemedial line oblique black, bent inwards to costa and excurved above inner margin; obicular represented by a brownish point; reniform small figure-of-eight-shaped defined by brown and with brown points at centres; the postmedial line arising from a black spot on costa then waved, excurved from below costa to vein 4, then slightly incurved; a pale subterminal line angled outwards above veins 6 and 4 and bent outwards to tornus, with black suffusion on its inner side towards costa, in the angles and on inner margin; a dark waved terminal line. Hindwing with the basal half pale yellowish extending on inner area to tornus; the terminal half fuscous brown with series of small whitish spots on termen and larger spot towards tornus. Under side yellowish white with fuscous brown terminal band, narrowing to tornus of each wing and with terminal series of dentate marks on forewing, lunulate marks on hindwing.

Hab. **Damaraland.** *Exp.* 52 mill. Type in B.M.

c. Hindwing of male normal.
- a^1. Forewing with the postmedial line angled inwards in discal and submedian folds .. .. *finifascia.*
- b^1. Forewing with the postmedial line angled inwards in submedian fold .. .. *salita.*
- c^1. Forewing with the postmedial line oblique throughout .. *xylina* (♀).

(26) Ophiusa finifascia, Wlk. xv. 1676 (1858).
Anua amplia, Wlk. xv. 1789 (1858).
Ophiusa dilecta, Wlk. xxxiii. 976 (1865).
Hab. **West Africa**, Sierra Leone, Old Calabar; **Natal** (Gueinzius). *Exp.* ♂ 46, ♀ 52 mill.

(27) Ophiusa salita, Dist. A.M.N.H. (7) i. p. 228 (1898).
Hab. **Transvaal**, Johannesburg (Ross). *Exp.* 50 mill.

(28) Ophius xylina, Dist. A.M.N.H. (7) i. p. 229 (1898).
Hab. **Transvaal**, Pretoria; **Cape Colony**, Transkei (Miss F. Barrett). *Exp.* 64 mill.

B. Fore femora of male not dilated.

(29) Ophiusa selenaris, Guen. Noct. iii. p. 232 (1852).
,, *obhærens*, Wlk. xv. 1830 (1858).
Pseudophia welwitschi, Feld. Reis. Nov. pl. 115, f. 2 (1874).
Hab. **West Africa**, Old Calabar; **Cape Colony** (Dr. Smith), Knysna, Transkei (Miss F. Barrett). *Exp.* 48 mill.

Auctorum.

Ophisma lunulifera, Wlk. xv. 956 (1865).
Type lost... ... ... South Africa.
Ophisma exuleata, Möschl. Verh. Zool. bot. Ges. Wien. xxxiii. p. 306, pl. xvi. f. 21 (1883) ... ... Cape Colony.

Sub-Family **MOMINÆ.**

Genus TRISULOIDES.

Type.
Trisuloides, Butl. A.M.N.H. (5) vii. p. 36 (1881) *sericea.*

Trisuloides lutescens, Herr.-Schäff. Aussereur. Schmett. f. 127 (1850).
Hab. **Cape Colony.** *Exp.* 50 mill.

Sub-Family **PLUSIANÆ.**

A. Forewing with tufts of raised scales on edges of stigmata .. .. *Abrostola.*
B. Forewing without tufts of raised scales .. .. *Plusia.*

Genus ABROSTOLA.

Type.
Abrostola, Ochs. Schmett. Eur. iv. p. 88 (1816) *triplasia.*

A. Forewing ochreous brown, the medial costal area suffused with black .. .. *brevipennis.*
B. Forewing grey-brown, the medial area without black suffusion *triopis.*

(1) Abrostola brevipennis, Wlk. xv. 1734 (1858).
Hab. **Natal** (Gueinzius), Victoria District (Gooch). *Exp.* 36 mill.

(2) Abrostola triopis, n sp.
♀. Grey-brown. Forewing slightly suffused with fuscous; a fine waved black antemedial line with rufous line on its inner side; the orbicular, reniform, and claviform, large, rounded with fine black outline and fuscous centre; a slightly sinuous fine black postmedial line with rufous line beyond it; a subterminal dentate fuscous line

with diffused fuscous line before it; a crenulate black terminal line. Hindwing fuscous brown; the interspaces of basal half whitish.

Hab. **Natal,** Durban (Bowker, Innes); **Cape Colony.** *Exp.* 36 mill. Type in B.M.

Genus PLUSIA.

Type.

Plusia, Ochs. Schmett. Eur. iv. p. 89 (1816)... *chrysitis.*

A. Forewing with a stigma below end of cell, generally Y or U-shaped.
- *a*. Hindwing orange .. .. *exquisita.*
- *b*. Hindwing not orange.
  - a^1. Forewing with the U-shaped stigma more or less separate from the spot at its lower extremity.
    - a^2. Forewing with cupreous suffusion on medial and terminal areas.
      - a^3. Forewing with the postmedial line angled outwards at vein 4 .. .. *chalcites.*
      - b^3. Forewing with the postmedial line not angled outwards at vein 4 .. .. *chalcedona.*
    - b^2. Forewing without cupreous suffusion on medial and terminal areas.
      - a^3. Forewing with brilliant silvery suffusion on medial inner and terminal areas .. .. *sestertia.*
      - b^3. Forewing without silvery suffusion on medial and terminal areas.
        - a^4. Forewing with bifid subterminal black spot between veins 3, 4 .. .. *geminipuncta.*
        - b^4. Forewing with pale pinkish spot on middle of termen .. .. *limbirena.*
        - c^4. Forewing without spot on middle of termen.
          - a^5. Forewing without black streaks on inner side of subterminal line.
            - a^6. Forewing with subbasal black points below the cell .. .. *signata.*
            - b^6. Forewing without subbasal black points below the cell .. .. *angulum.*
          - b^5. Forewing with black streaks on inner side of subterminal line .. .. *ni.*
  - b^1. Forewing with the U-mark and spot completely confluent.
    - a^2. Forewing with the marks forming an elongate V with bent extremity.
      - a^3. Forewing with the extremity of V short.
        - a^4. Forewing with the subterminal line strongly angled inwards at middle .. .. *lavendula.*
        - b^4. Forewing with the subterminal line not angled inwards but with black streaks on its inner side .. .. *circumflexa.*
      - b^3. Forewing with the extremity of V long and reaching or almost reaching postmedial line .. *daubei.*
    - b^2. Forewing with the marks forming an elongate oblique vitta.
      - a^3. Forewing with white-edged subapical lunulate mark .. .. *arachnoides.*
      - b^3. Forewing without white-edged lunulate subapical mark .. .. *oxygramma.*

B. Forewing without stigma below end of cell.
  a. Forewing with brilliant brassy patch on terminal area extending inwards below cell .. .. *orichalcea*.
  b. Forewing without brassy patch.
    a^1. Forewing olive-grey with dark patch on inner medial area .. .. *fracta*.
    b^1. Forewing chestnut-brown without dark patch on inner medial area .. .. *ablusa*.

(1) Plusia exquisita, Feld. Reis. Nov. pl. 110, f. 30 (1874).
Hab. **Natal**, Northdene; **Cape Colony**, Transkei (Miss F. Barrett), Wynberg (Trimen). *Exp.* 40 mill.

(2) Plusia chalcites, Esp. Schmett. 141, 3 (1789).
,, *eriosoma*, Doubl. Dieffenbach's N. Zealand, ii. p. 285 (1843).
,, *verticillata*, Guen. Noct. ii. p. 344 (1852).
Hab. **North** and **South America**; **Europe**; **West Africa**; **Sokotra**; **British East Africa**; **British Central Africa**; **Mashonaland**, Salisbury (Marshall); **N'Gamiland** (Lugard); **Natal**, Karkloof (Marshall), Durban (Leigh); **Aden**; **Japan**; **China**; **India**; **Ceylon**; **Burma**; **Malayan** and **Australian** regions; **Hawaii**. *Exp.* 42 mill.

(3) Plusia chalcedona, n. sp.

Head and thorax brown and grey; tegulæ with a fiery red band; metathorax with chestnut tuft; abdomen grey-brown; male with lateral tufts of long ochreous hair at base and towards extremity. Forewing purplish grey irrorated with black and largely suffused with red-brown; some brilliant metallic copper suffusion on inner half of medial area and on terminal area and a spot below base of cell; an antemedial silvery point below costa and oblique line from cell to inner margin, its upper extremity confluent with the silvery **U**-mark which is separate from the small elliptical spot beyond its lower extremity; the postmedial line silvery, oblique, minutely dentate, angled outwards at vein 1 and with oblique straight silvery line beyond it from below costa to vein 3; the subterminal line indistinct, sinuous, bent outwards to apex and with silvery mark on it in submedian interspace; some silvery striæ on termen from below apex to vein 3. Hindwing dark brown, the interspaces whitish towards base; an indistinct discoidal lunule and postmedial line.

Hab. **Natal**, Estcourt (Hutchinson). *Exp.* 30 mill. Type in B.M.

(4) Plusia sestertia, Feld. Reis. Nov. pl. 110, f. 31 (1874).
Hab. **Natal,** Karkloof (Marshall); **Cape Colony,** Knysna (Trimen). *Exp.* 32 mill.

(5) Plusia geminipuncta, n. sp.
♂. Head and thorax dark brown mixed with grey; abdomen fuscous brown. Forewing purplish grey irrorated with black and largely suffused with red-brown; an antemedial silvery point below costa and oblique line from cell to inner margin; the U-mark small silvery and separate from the silvery ring-spot beyond its lower extremity; the postmedial and subterminal lines dark olive-brown with silvery tinge on their outer edge, the former bent outwards below costa, excurved to vein 3, then slightly incurved and oblique, the latter excurved below costa, then oblique and with geminate black spot beyond its middle before termen. Hindwing dark brown, the interspaces of basal half whitish.
Hab. **Natal,** Mooi River. *Exp.* 30 mill. Type in B.M.

(6) Plusia limbirena, Guen. Noct. ii. p. 350 (1852).
Hab. **St. Helena; British East Africa,** Machakos; **Mashonaland,** Salisbury (Marshall); **Delagoa Bay** (Junod); **Natal,** Estcourt (Hutchinson); **Cape Colony** (Dr. Smith); **Aden; India; Ceylon.** *Exp.* 42 mill.

(7) Plusia signata, Fabr. Ent. Syst. iii. 2, p. 81 (1792).
Hab. **West Africa,** Sierra Leone; **Natal,** Durban (Leigh); **China; India; Ceylon; Java; Fiji.** *Exp.* 32 mill.

(8) Plusia angulum, Guen. Noct. ii. p. 350 (1852).
Hab. **Natal,** Estcourt (Hutchinson), Durban (Leigh); **Cape Colony** (Trimen). *Exp.* 42 mill.

(9) Plusia ni, Hübn. Noct. pl. 58, f. 284 (1827).
Hab. **West Indies; Cape Verd Islands; Cape Colony,** Capetown (Lightfoot); **Persia; Japan; China; India.** *Exp.* 38 mill.

(10) Plusia lavendula, n. sp.
♂. Lilacine grey; palpi brownish at sides: tegulæ with brownish band and black lateral points; thorax tinged with brown; abdomen pale grey with the dorsal crests mostly brown. Forewing with brown suffusion on costa before the antemedial line, on medial area except

towards inner margin and on inner side of subterminal line ; a sinuous silvery white subbasal line from costa to submedian fold ; the antemedial line silvery defined by blackish, sinuous and excurved in submedian interspace ; the stigma below end of cell silvery, Y-shaped with its tail bent outwards ; the postmedial line grey defined by blackish, minutely dentate and angled inwards in discal and submedian folds ; the subterminal line excurved below costa, strongly angled inwards in discal fold and incurved in submedian fold with indistinct dentate brown line beyond it from costa to vein 3 ; cilia white intersected with brown. Hindwing whitish, the veins and broad terminal band brown ; the under side with indistinct medial and postmedial lines.

Hab. **Cape Colony.** *Exp.* 44 mill. Type in B.M.

(11) Plusia circumflexa, Linn. Syst. Nat. i. 2, p. 844 (1758).
,, *patefacta*, Wlk. xii. 924 (1856).
Hab. **Europe ; Madeira ; Canaries ; Transvaal** (Ross) ; **Natal,** Estcourt (Hutchinson) ; **Cape Colony,** Grahamstown (Tuck), Capetown (Trimen) ; **Persia ; India ; Ceylon.** *Exp.* 40 mill.

(12) Plusia daubei, Boisd. Ind. Méth. p. 159 (1840).
,, *dorfmeisteri*, Feld. Reis. Nov. pl. 110, f. 33 (1874).
Hab. **Europe ; West Africa,** Congo ; **Senegal ; Mashonaland,** Salisbury (Marshall) ; **Natal,** Estcourt (Hutchinson) ; **Cape Colony,** Knysna (Trimen) ; **India.** *Exp.* 34 mill.

(13)*Plusia arachnoides, Dist. Entom. 1901, p. 285.
Hab. **Transvaal.** *Exp.* 34 mill.

(14) Plusia oxygramma, Hübn. Zütr. p. 37, ff. 769–770 (1827).
Abrostola transfina, Wlk. xii. 884 (1856).
Hab. **British East Africa,** Machakos ; **Natal** (Gueinzius), Malvern (Marshall) ; **Western Asia ; Japan ; China ; India ; Ceylon ; Java ; Australia ; Fiji.** *Exp.* 42 mill.

(15) Plusia orichalcea, Fabr. Spec. Ins. ii. p. 227 (1781).
Hab. **Azores ; Madeira ; Canaries ; St. Helena ; Ascension ; West Africa ; British East Africa ; Mashonaland,** Salisbury (Marshall) ; **Transvaal** (Ross) ; **Natal** (Burrows), Malvern (Marshall), Durban (Bowker) ; **Cape Colony,** Grahamstown ; **Mauritius ; Arabia ; Japan ; China ; Formosa ; India ; Ceylon ;** *Exp.* 44 mill.

(16) Plusia fracta, Wlk. xii. 920 (1856).
Hab. **West Africa,** Congo; **Abyssinia; Natal,** Durban (Barker); **India; Ceylon.** *Exp.* 38–42 mill.

(17) Plusia ablusa, Feld. Reis. Nov. pl. 110, f. 34 (1874).
Hab. **Natal,** Estcourt (Hutchinson); **Cape Colony,** Dordrecht, Knysna (Trimen). *Exp.* 36 mill.

Auctorum.

Plusia melanocephala, Möschl. Verh. z. b. Ges. Wien. xxxiii. p. 297, pl. xvi. f. 11 (1884) ... ... Cape Colony.

Sub-family NOCTUINÆ.

A. Forewing with vein 9 from 10 anastomosing with 8 to form the areole.
a. Abdomen with dorsal crests.
a^1. Frons with upright saw-like corneous process .. .. *Prionofrontia.*
b^1. Frons without corneous process.
a^2. Thorax with paired dorsal ridge-like crests .. .. *Antiophlebia.*
b^2. Pro- and meta-thorax with spreading crests.
a^3. Palpi with the third joint long and naked.
a^4. Hindwing with the costa lobed at base .. *Œdebasis.*
b^4. Hindwing with the costa not lobed at base.. *Labanda.*
b^3. Palpi with the third joint short .. .. *Risoba.*
c^2. Thorax without crests.
a^3. Abdomen dorsally clothed with rough hair.
a^4. Palpi with the second joint fringed with hair in front.
a^5. Wings with the cilia crenulate.
a^6. Wings with the termen angled at middle .. .. *Lacera.*
b^6. Wings with the termen not angled at middle.
a^7. Palpi with the second joint reaching above vertex of head .. *Tavia.*
b^7. Palpi with the second joint not reaching vertex of head .. .. *Serrodes.*
b^5. Wings with the cilia non-crenulate .. *Facidia.*
b^4. Palpi with the second joint smoothly scaled in front.
a^5. Palpi with the third joint long and dilated at extremity .. .. *Sphingomorpha.*
b^5. Palpi with the third joint moderate, not dilated at extremity .. .. *Catephia.*
b^3. Abdomen smoothly scaled except the dorsal crests .. .. *Polydesma.*
b. Abdomen without dorsal crests.
a^1. Frons with truncate conical prominence with raised rim at extremity interrupted below .. .. *Proruaca.*
b^1. Frons with pointed conical prominence.

a^2. Hindwing with veins 3, 4 stalked .. .. *Authadistis.*
b^2. Hindwing with veins 3, 4 from cell .. .. *Proconis.*
c^1. Frons without prominence.
a^2. Forewing without antemedial lobe and scale-tooth on inner margin.
a^3. Palpi with the second and third joints upturned; frons without tuft of hair.
a^4. Palpi with tufts of hair on inner side of second joint at extremity and on inner side of third joint .. .. *Meliaba.*
b^4. Palpi without tufts of hair on inner side of second and third joints.
a^5. Palpi with the second joint broadly scaled in front .. .. *Calesia.*
b^5. Palpi with the second joint smoothly scaled in front.
a^6. Palpi with the third joint very long.
a^7. Palpi with the second joint reaching above vertex of head .. *Mecodina.*
b^7. Palpi with the second joint not reaching vertex of head.
a^8. Hindwing with veins 3, 4 stalked or coincident .. .. *Mesogenea.*
b^8. Hindwing with veins 3, 4 from cell.. .. .. *Fodina.*
b^6. Palpi with the third joint minute .. *Bareia.*
b^3. Palpi with the second joint upturned, the third porrect; frons with tuft of hair.
a^4. Palpi with the third joint prominent .. .. *Thermesia.*
b^4. Palpi with the third joint minute, hidden in scales .. .. *Acantholipes.*
c^3. Palpi with the second joint porrect, the third upturned; frons with tuft of hair .. .. .. *Parathermes.*
d^3. Palpi porrect .. .. *Rhanidophora.*
e^3. Palpi rostriform, the second and third joints triangularly scaled .. .. *Hypocala.*
b^2. Forewing with antemedial lobe and scale-tooth on inner margin.
a^3. Palpi upturned.
a^4. Palpi with the second joint broadly scaled in front .. .. *Plusiodonta.*
b^4. Palpi with the second joint smoothly scaled in front .. .. *Mænas.*
b^3. Palpi porrect .. .. *Calpe.*
B. Forewing with veins 7, 8, 9 stalked, 10 from cell .. .. .. *Earias.*

Genus PRIONOFRONTIA, nov.

Proboscis fully developed; palpi upturned, the second joint reaching vertex of head and fringed with scales in front, the third long; frons with large prominence with vertical saw-like corneous edge in front; antennæ of male bipectinate with short branches ending in a bristle; tibiæ fringed with spinous hair above; abdomen with large dorsal crests. Forewing with slight scale tooth at tornus; veins 3

and 5 from near angle of cell; 6 from upper angle; 9 from 10 anastomosing with 8 to form the areole; 11 from cell. Hindwing with veins 3, 4 from angle of cell; 5 from just above angle; 6, 7 from upper angle.

PRIONOFRONTIA ERYGIDIA, n. sp.

♂. Head and thorax grey mottled with brown and black; pectus and legs ochreous, the tarsi banded with black; abdomen ochreous dorsally suffused with fuscous. Forewing grey variegated with brown and irrorated with black; numerous indistinct strongly waved black lines; a subbasal ochreous white spot above vein 1 followed by a larger rufous spot with its outer edge produced to a tooth; three short subterminal streaks below apex. Hindwing ochreous; the terminal area suffused with brown, the veins of terminal area streaked with brown; a dark crenulate terminal line.

Hab. **Natal,** Victoria District (Gooch). *Exp.* 40 mill. Type in B.M.

GENUS ANTIOPHLEBIA.

Type.

Antiophlebia, Feld. Reis. Nov. p. 2 (1874), non descr. ... ... *bracteata.*

Proboscis aborted, minute; palpi obliquely upturned, reaching vertex of head and moderately scaled; frons with pointed tuft of hair; antennæ in both sexes bipectinate with moderate branches, the apical part simple; thorax with very large paired subdorsal ridges of scales arching over dorsum; tibiæ fringed with long hair; abdomen with dorsal crests on basal segments. Forewing with the inner margin excised towards tornus which is hooked; veins 3 and 5 from near angle of cell; 9 from 10 anastomosing with 8 to form the areole, 6 from the areole; 11 from cell. Hindwing with vein 2 from towards angle of cell; 3, 4 shortly stalked; 5 from above angle; 6, 7 from upper angle.

ANTIOPHLEBIA BRACTEATA, Feld. Reis. Nov. pl. 99, f. 18 (1874).

Hab. **N'Gamiland** (Lugard); **Natal,** coast-belt (Barker); **Cape Colony,** Annshaw (Miss F. Barrett). *Exp.* ♂ 46, ♀ 52 mill.

GENUS MELIABA.

Type.

Meliaba, Wlk. xvi. 212 (1858) ... ... *pelopsalis.*

MELIABA PELOPSALIS, Wlk. xvi. 212 (1858).

Hab. **Natal,** Durban (Gueinzius, Leigh). *Exp.* 40 mill.

Genus ŒDEBASIS, nov.

Proboscis fully developed; palpi with the second joint obliquely upturned, moderately scaled, the third joint long, naked, porrect; frons with tuft of scales; antennæ of male almost simple; pro- and meta-thorax with tufts of scales; tibiæ rather hairy, the inner spurs very long; abdomen with dorsal crests. Forewing narrow, the apex produced and termen oblique, the inner margin lobed at base; veins 3 and 5 from near angle of cell; 6 from upper angle; 9 from 10 anastomosing with 8 to form the areole, 7 from beyond the areole; 11 from cell. Hindwing narrow, the basal half of costa highly lobed; veins 3, 4 from angle of cell; 5 fully developed from well above angle of cell; 6, 7 from upper angle; 8 anastomosing with the cell near base, then running along it for some distance.

*Œdebasis ovipennis, n. sp.

♂. Head, thorax, and abdomen pale reddish brown mixed with black; palpi blackish at sides; tegulæ with black medial line. Forewing pale red-brown irrorated with black; the costa spotted with black; a curved black streak above base of inner margin; a waved subbasal line from costa to vein 1 with a blackish spot in the cell between it and the indistinct waved antemedial line; claviform large defined by black and filled in with blackish; orbicular and reniform large, elliptical, defined by black, the former somewhat oblique; the postmedial line highly dentate, bent outwards below costa, excurved to vein 4, then incurved; some pale points on apical part of costa; traces of a waved whitish subterminal line; diffused blackish streaks on terminal area above veins 2, 3, 4, 5; cilia blackish intersected with pale rufous. Hindwing pale fuscous brown; cilia white with brown line at base on apical half; the under side pale brownish, the costal area whitish irrorated with brown.

♀. Vertex of thorax white; abdomen whitish at base; forewing with the inner margin white expanding at middle up to submedian fold; a white patch from outer edge of claviform and inner edge of reniform to costa and apical part of termen, a sinuous white subterminal line; the wings broader, the costa of hindwing slightly lobed.

Hab. **Delagoa Bay** (Mrs. Monteiro). *Exp.* 30 mill. Type in Coll. Druce.

Genus LABANDA.

	Type.
Labanda, Wlk. xvii. 284 (1859)	*herbealis*.

Labanda bryochlora, n. sp.

♀. Head, thorax, and abdomen bright green mixed with black;

pectus, legs, and abdomen ochreous, fore and mid tibiæ green above, the tarsi banded with black; abdomen with subdorsal black points. Forewing bright green irrorated with black and slightly suffused on medial and apical areas with leaden fuscous; a waved subbasal black line; a double waved antemedial line angled inwards in cell and submedian fold; a more prominent double waved medial line angled at vein 2, then incurved; the reniform with black outline and pale green annulus; a double waved postmedial line bent outwards below costa, excurved to vein 3, then oblique, with white points at veins 3, 2, and 1, and another waved line just beyond it; an irregularly dentate subterminal line with a prominent angle at middle defined by black on inner side; a terminal series of small black lunules. Hindwing black-brown with some green and black on terminal part of vein 2; cilia ochreous and black. Under side of forewing fuscous brown, the costa purplish red with some white points; hindwing white irrorated and the terminal area suffused with brown the apical area with red; a prominent discoidal spot, a curved medial line, and two dentate and a curved line on terminal area.

Hab. **Natal,** Karkloof (Marshall). *Exp.* 38 mill. Type in B.M.

Genus RISOBA.

Risoba, Moore, P.Z.S. 1881, p. 328 ... ... Type. *repugnans*.

Risoba obstructa, Moore, P.Z.S., 1881, p. 328; id. Lep. Ceyl. iii. pl. 144, ff. 2, 2ab. (larva).

Hab. **British East Africa,** Tana River, Sambaru; **N'Gamiland** (Lugard); **North China; Loochoo Islands; India, Ceylon,** and **Burma; Malacca; Java.** *Exp.* 28–36 mill.

Genus LACERA.

Lacera, Guen. Noct. iii. p. 336 (1852)... ... ... Type. *alope*.

Lacera alope, Cram. Pap. Exot. iii. pl. 286, E.F. (1779).

Hab. **British Central Africa,** Zomba, Blantyre; **Natal,** Victoria District (Gooch); **Madagascar; Japan; China; India, Ceylon,** and **Burma; Malacca; New Guinea.** *Exp.* 48–64 mill.

Genus TAVIA.

Tavia, Wlk. xiv. 1275 (1858)... ... ... Type. *nycterina*.

Tavia nycterina, Boisd. Fauna Ent. Mad. p. 109, pl. 13, *f.* 6 (1833).

Tavia instruens, Wlk. xiv. 1275 (1858).

Hab. **West Africa,** Congo; **Natal,** Mooi River, Durban (Innes); **Cape Colony,** Transkei (Miss F. Barrett); **Madagascar.** *Exp.* 56–60 mill.

Genus SERRODES.

	Type.
Serrodes, Guen. Noct. iii. p. 251 (1852)	*inara.*

Serrodes inara, Cram. Pap. Exot. iii. p. 239 E. (1779).

Phoberia korana, Feld. Reis. Nov. pl. 116, f. 3 (1874).

Hab. **West Africa,** Sierra Leone, Congo; **British East Africa,** Neugia; **Natal,** Estcourt (Hutchinson); **Cape Colony,** Transkei (Miss F. Barrett); **India, Ceylon,** and **Burma; Borneo; Java; Australia.** *Exp.* 52–74 mill.

Genus FACIDIA.

	Type.
Facidia, Wlk. xxxiii. 951 (1865)	*nigrofusca.*

Facidia nigrofusca, Wlk. xxxiii. 952 (1865).

Hab. **Natal** (Gueinzius). *Exp.* 52 mill.

Genus SPHINGOMORPHA.

	Type.
Sphingomorpha, Guen. Noct. iii. p. 220 (1852)	*chlorea.*

A. Abdomen with dorsal series of white patches .. .. *chlorea.*
B. Abdomen without dorsal series of white patches .. .. *marshalli.*

(1) Sphingomorpha chlorea, Cram. Pap. Exot. ii. pl. 104, C. (1779).
„ *monteironis*, Butl. A.M.N.H. (4) xvi. p. 406 (1875).

Hab. **West Africa,** Sierra Leone, North-west Nigeria, Congo, Angola; **Soudan,** White Nile; **Erithrea,** Massowah; **Abyssinia; British East Africa,** Wadelai, Masailand, Neugia, Machakos; **British Central Africa,** Blantyre; **Mashonaland,** Salisbury (Marshall); **Natal** (Gooch); **Cape Colony,** Annshaw (Miss F. Barrett); **Aden; India, Ceylon,** and **Burma.** *Exp.* 60–84 mill.

(2) Sphingomorpha marshalli, n. sp.

♀. Head and thorax clothed with black, brown, and ochreous scales; tegulæ with some white scales towards extremity; abdomen

ochreous irrorated with brown. Forewing variegated with ochreous and purple-brown and irrorated with black; the subbasal line represented by obscure black spots with white scales on them below costa and cell; the antemedial line blackish defined by white on costal half, angled outwards below costa and on median nervure and excurved to inner margin; the orbicular a small black spot with white annulus, the reniform a black bar outlined with white and with reniform black-brown patch beyond it before the postmedial line which is minutely dentate and oblique from costa to vein 6, thence incurved to near origin of vein 2, then oblique to inner margin and with a white-edged triangular black patch beyond it on costa; an obscure dentate subterminal line; a terminal series of white points. Hindwing yellowish white, the terminal third suffused with fuscous brown; the under side with discoidal point and postmedial line angled in discal fold, the area beyond it irrorated with brown.

Hab. **Mashonaland,** Umtali (Marshall). *Exp.* 52 mill. Type in B.M.

Genus CATEPHIA.

	Type.
Catephia, Ochs. Schmett. Eur. iv. p. 94 (1816)	*alchemista.*
Ædia, Hübn. Verz. p. 260 (1827)	*leucamelas.*

Sect. I. Antennæ of male bipectinate with short branches.

(1) Catephia nigrescens, Wllgrn. Anteckn. i. Zool. i. p. 64 (1856).
Agrotis inquieta, Wlk. x. 340 (1856).
Hadena teretiplaga, Wllgrn. Wien. Ent. Mon. iv. p. 170 (1860).
Ædia sofala, Feld. Reis. Nov. pl. 110, f. 2 (1874).
Hab. **British East Africa,** Kikuyu; **Cape Colony** (Dr. Smith), Annshaw (Miss F. Barrett). *Exp.* 28–36 mill.

Sect. II. Antennæ of male ciliated.

A. Forelegs of male fringed with very long thick hair; hindwing with fold and rough hair at tornus on under side.

(2) Catephia natalensis, n. sp.

♂. Black-brown. Forewing with the apical area paler; the lines black, indistinct; the antemedial and medial lines waved; the orbicular a black point; the reniform indistinct with a black annulus below it below base of vein 3; the postmedial line more prominent, sinuous, oblique from costa to vein 4 then retracted to an angle on

vein 1 near medial line and bent outwards again to inner margin; traces of a pale waved subterminal line. Hindwing fuscous black with rather broad oblique white medial band from vein 7 to submedian fold where it narrows to a point; a small subterminal white spot at vein 2 and a small spot at apex.

Hab. **Natal,** Victoria District (Gooch). *Exp.* 52 mill. Type in B.M.

B. Mid and hind femora of male very thickly fringed with long black scales; hindwing suffused with black scales below.

(3) Catephia amplificans, Wlk. xv. 1810 (1858).

Hab. **Natal** (Gueinzius, Gooch). *Exp.* ♂ 50, ♀ 54 mill.

C. Mid tibiæ of male very thickly fringed with long hair; hindwing with the base and inner area clothed with yellowish hair on under side.

(4) Catephia squamosa, Wllgrn. Anteckn. i. Zool. i. p. 64 (1856).

Plusia inconclusa, Wlk. xii. 925 (1857).

Anaphia discistriga, Wlk. xiii. 1128 (1857).

Hab. **British East Africa,** Kikuyu, Tanga; **N'Gamiland** (Lugard); **Natal,** Durban (Gueinzius, Leigh). *Exp.* 34 mill.

D. Legs of male normal.
- *a.* Hindwing with the basal area white .. .. *striata.*
- *b.* Hindwing with white antemedial patch.
  - a^1. Forewing without black subapical spots.
    - a^2. Forewing tinged with olive-green .. .. *virescens.*
    - b^2. Forewing not tinged with olive-green .. .. *dulcistriga.*
  - b^1. Forewing with two black subapical spots .. .. *bipuncta.*

(5) Catephia striata, n. sp.

♀. Head whitish mixed with black; palpi marked with black at sides; tegulæ pale olive-green with a black medial line; patagia and thorax black and brown; pectus, legs, and abdomen pale brownish irrorated with black, the pectus with purplish and white hair in front. Forewing pale brownish tinged with olive-green; the basal half suffused with black except the inner margin also the terminal half between veins 4 and 1; black streaks below the cell and on inner area before middle and on the veins of terminal area also some striæ in the interspaces; orbicular small black-edged; reniform and transverse lines absent; some pale points on costa towards apex and some black points on termen; cilia black between veins 4 and 1. Hindwing white tinged with ochreous; the terminal area black; the inner margin tinged with black; cilia ochreous black between veins

2, 3. Under side ochreous white; forewing with black discoidal lunule; both wings with broad black subterminal band.

Hab. **Natal,** Durban (Leigh). *Exp.* 30 mill. Type in B.M.

(6) Catephia virescens, n. sp.

♀. Head, thorax, and abdomen olive-green mixed with black; pectus with some purplish hair in front. Forewing pale brown tinged with olive-green and suffused with black especially on basal area, inner medial area and subapical area; an indistinct black streak in submedian fold; the antemedial line black defined by pale brown on inner side, minutely waved, oblique and bent inwards between submedian fold and vein 1; orbicular small, indistinct; reniform, large pale with blackish outline and somewhat constricted at middle; postmedial line black, minutely waved, very oblique from costa to vein 4, then inwardly oblique and with whitish point in submedian fold; traces of a dentate subterminal line; a black spot in submedian fold; cilia brownish intersected with black. Hindwing black with antemedial white patch from subcostal nervure to submedian fold; cilia white, blackish at apex, below middle and at tornus. Under side brownish at base, with ill-defined white medial band, the terminal half black with a terminal series of brownish points.

Hab. **Natal,** Durban (Leigh). *Exp.* 30 mill. Type in B.M.

(7) Catephia dulcistriga, Wlk. xv. 1811 (1858).

Hab. **West Africa,** Niger River; **British Central Africa,** Zomba; **Natal,** Durban (Leigh); **Cape Colony; India; Burma.** *Exp.* 28 mill.

(8) Catephia bipuncta, n. sp.

♀. Dark reddish brown; head, thorax, and abdomen irrorated with white; tarsal joints ringed with white. Forewing with subbasal black line from costa to submedian fold edged by pale brown on outer side; a subbasal black point in submedian fold; a black antemedial line from costa to vein 1 defined by brownish on inner side and slightly angled inwards on median nervure; the postmedial line sinuous, bent inwards to costa and excurved at middle; a terminal series of small black lunules of which two below apex are more prominent and subterminal, the series crossed at middle by an oblique black shade from below costa. Hindwing black with antemedial white patch between subcostal nervure and vein 1; the cilia and termen white below apex. Under side of forewing with medial

white patch in and below cell; both wings with white points on the cilia.

Hab. **Natal**, Durban (Leigh). *Exp.* 36 mill. Type in B.M.

AUCTORUM.

Anophia illegitima, Wllgrn. Œfv. K. Vet. Akad. Förh. 1875, p. 82 ... ... Transvaal.
Catephia personata, Wlk. xxxiii. 916 (1867). Type lost... ... ... South Africa.

GENUS POLYDESMA.

	Type.
Polydesma, Boisd. Faun. Ent. Madag. Lep. p. 100 (1833)	*collutrix.*
Ericeia, Wlk. xiii. 1089 (1857)	*inangulata.*
Pandesma, Guen. Noct. ii. p. 438 (1833) ...	*quenavadi.*

Sect. I. (*Polydesma*). Pectus of male clothed with long hair; fore tibiæ fringed with very long hair; under side of forewing with some long hair in cell, of hindwing with the basal area clothed with long silky hair.

A. Under side of hindwing of male with diffused fuscous postmedial band .. .. *umbricola.*
B. Under side of hindwing of male wholly ochreous .. .. *otiosa.*

(1) POLYDESMA COLLUTRIX, Geyer. Zutr. 22. 443, ff. 885, 886 (1827).
„ *umbricola*, Boisd. Faun. Ent. Madag. Lep. p. 108 (1833).
„ *sagulata*, Wllgrn. Œfv. Vet. Akad. Förh., 1875, p. 117.

Hab. **West Africa**, Old Calabar, Niger; **Upper Egypt**, White Nile; **British East Africa**, Wadelai, Machakos; **British Central Africa**, Zomba; **Mashonaland**, Salisbury (Marshall); **Transvaal**; **Natal**, Estcourt (Hutchinson); **Madagascar**; **Formosa**; **India**, **Ceylon**, and **Burma**; **Andamans**; **Singapore**. *Exp.* 50 mill.

(2) POLYDESMA OTIOSA, Guen. Noct. ii. p. 442 (1852).
„ *determinata*, Wllgrn. Wien. Ent. Mon. vii. p. 149 (1863).

Hab. **Damaraland**, Kuisip River; **India**. *Exp.* 44 mill.

Sect. II. (*Ericeia*). Pectus, femora, and tibiæ of male clothed with long hair, mid tibiæ with tuft of hair and large scales contained in a fold, hind tarsi fringed with long hair above.

(3) Polydesma inangulata, Guen. Noct. iii. p. 210 (1852); Moore, Lep. Ceyl. iii. pl. 156, f. 6, 6*a*.

Remigia congressa, Wlk. xiv. 1510 (1858).

Ophisma statina, Möschl. Verh. Zool. bot. Ges. Wien. xxxiii. p. 305, pl. xvi., f. 19 (1883).

Hab. **West Africa**, Niger River; **Ashanti**; **Natal** (Gueinzius, Gooch, Burrows); **China**; **Formosa**; **India, Ceylon,** and **Burma**; **Andamans**; **Australia.** *Exp.* 48–54 mill.

Sect. III. Fore tibiæ of male greatly dilated and with ridges of scales enclosing a large hollow above.

(4) Polydesma globulipes, Wlk. xxxiii. 885 (1865).

Brujas incivilis, Wlk. xxxiii. 937 (1865).

Hab. **West Africa**, Sierra Leone; **Upper Egypt**, White Nile; **Abyssinia**; **German Central Africa**, Tanganyika; **Ovampo Land** (Eriksson). *Exp.* 44 mill.

Sect. III. (*Pandesma*). Pectus and fore tibiæ of male with shorter hair; under side of wings without long hair.

A. Forewing with waved black streak below the cell .. .. .. *basilinea.*
B. Forewing without black streak below the cell.
a. Forewing tinged with green .. .. *marmorifera.*
b. Forewing not tinged with green.
*a*¹. Hindwing with diffused brownish terminal band .. .. *quenavadi.*
*b*¹. Hindwing with broad black terminal band from costa to vein 2 .. .. *amphix.*

(5) Polydesma basilinea, n. sp.

Head and thorax reddish brown slightly mixed with black; pectus and legs pale, the latter banded with black; abdomen brown, the ventral surface pale. Forewing pale suffused with red-brown and with a slight olive tinge; a waved black streak below the cell becoming straight and oblique below vein 2; a series of brown striæ on costa; indistinct double waved subbasal and antemedial lines; orbicular and reniform with fine black outlines, large rounded and extending to below cell; the veins beyond the cell streaked with black; an indistinct double minutely dentate postmedial line, bent outwards below costa, excurved to vein 4, then oblique; an indistinct waved subterminal line; a terminal series of small black lunules. Hindwing ochreous white, irrorated and tinged with brown and the veins towards termen streaked with brown. Under side whitish; both wings with slight discoidal spot and indistinct

curved postmedial line, bent inwards and more prominent at costa of forewing.

Hab. **Natal,** Victoria District (Gooch). *Exp.* ♂ 36, ♀ 40 mill. Type in B.M.

(6) Polydesma marmorifera, Wlk. xv. 1718 (1858).
Hab. **Natal** (Gueinzius), Durban (Leigh). *Exp.* ♂ 44, ♀ 50 mill.

(7) Polydesma quenavadi, Guen. Noct. ii. p. 438 (1852); Moore, Lep. Ceyl. iii. pl. 156, f. 1.
Thria robusta, Wlk. xiii. 1112 (1857).
Pandesma opposita, Wllgrn. Wien. Ent. Mon. vii. p. 149 (1863).
Hab. **Upper Egypt,** White Nile; **Red Sea,** Suakim; **British East Africa,** Lari, Machakos; **Damaraland,** Kuisip; **Transvaal** (Ross); **Natal,** Estcourt (Hutchinson); **Basutoland,** Maseru (Crawshay); **Aden; Persia; India, Ceylon,** and **Burma.** *Exp.* 40–56 mill.

(8) Polydesma amphix, Cram. Pap. Exot. ii. pl. 134, c (1779).
Hab. **Damaraland,** Kuisip; **India; West Australia.** *Exp.* 32–38 mill.

Genus PRORUACA, nov.

Type *P. recurrens.*

Proboscis fully developed; palpi short, porrect; frons with large conical prominence with raised rim at extremity broken down below; antennæ of female ciliated; thorax with slight crests behind collar and on metathorax; abdomen smoothly sealed. Forewing with veins 3 and 5 from near angle of cell; 6 from upper angle; 9 from 10 anastomosing with 8 to form the areole. Hindwing with veins 3, 4 from angle of cell; 5 from just above angle; 6, 7 from upper angle.

Sect. I. Frons without ridges across the hollow of the frontal prominence.

(1) Proruaca recurrens, n. sp.

♀. Head and thorax grey mixed with black; tegulæ edged with black, patagia at extremities and metathorax blackish; pectus whitish; abdomen grey tinged with brown, the ventral surface whitish. Forewing grey suffused with fuscous especially on inner and terminal areas; a black point at base of cell; the subbasal line angled outwards to the antemedial line below costa, then oblique to its

termination at submedian fold; the antemedial line very slightly angled inwards below costa to meet the subbasal line, then oblique to submedian fold, then incurved, with an indistinct line parallel to its inner edge; an indistinct medial line double towards costa, oblique from costa to middle of cell, angled inwards on median nervure and vein 1 and outwards in submedian fold; a white discoidal spot with a dark-edged lunule on it; the postmedial line bent outwards below costa, angled inwards at vein 5, at vein 3 recurved up to lower angle of cell, then sinuous to inner margin; a nearly straight subterminal line slightly bent outwards to costa and with some pale rufous on its outer edge; a fine sinuous terminal line. Hindwing white tinged with fuscous towards termen; cilia white.

Hab. **N'Gamiland** (Lugard). *Exp.* 36 mill. Type in B.M.

Sect. II. Frons with ridges across the hollow of the frontal prominence.

(2)*Proruaca harmonica, Dist. Entom., 1901, p. 284.

Hab. **Transvaal.** *Exp.* 46 mill.

Genus AUTHADISTIS, nov.

Proboscis fully developed; palpi porrect extending to just beyond frons, the second joint broadly fringed with scales below, the third short downturned; frons with conical prominence; antennæ of male bipectinate with long branches, the apical part serrate; metathorax with large tuft of scales; abdomen smoothly scaled. Forewing with veins 3 and 5 from near angle of cell; 6 from upper angle; 9 from 10 anastomosing with 8 to form the areole. Hindwing with veins 3, 4 stalked; 5 from just above angle of cell; 6, 7 from upper angle; 8 anastomosing with the cell to near middle.

Authadistis metaleuca, n. sp.

Head and thorax purplish fuscous, the scales pencilled with grey, the metathoracic tuft black; abdomen white, often tinged with fuscous. Forewing purplish fuscous, slightly suffused with grey; traces of a short double subbasal line; the antemedial line black, oblique from costa to submedian fold, where it is obtusely angled and with traces of a line on its inner side; traces of a double sinuous medial line; the orbicular small, grey, defined by blackish; the postmedial line black, bisinuate from costa to submedian fold, then excurved to lower angle of cell, then strongly excurved again; the

subterminal line indistinct, connected with apex by short streaks and slightly angled inwards in submedian fold; a fine waved black terminal line. Hindwing white, the costal area and termen more or less strongly tinged with fuscous; in female nearly the whole wing sometimes suffused with fuscous.

Hab. **Mashonaland,** Salisbury (Marshall). *Exp.* 24 mill. Type in B.M.

Genus PROCONIS, nov.

Proboscis fully developed; palpi obliquely upturned, the second joint moderately scaled, the third long, naked; frons with pointed conical prominence; antennæ of male ciliated; tibiæ with the spurs moderate and with tufts of spinous hair on outer side; abdomen smoothly scaled with scale-crest on basal segment. Forewing with vein 3 from before angle of cell, 5 from just above angle; 6 from upper angle; 9 from 10 anastomosing with 8 to form the areole. Hindwing with veins 3, 4 from angle of cell; 5 from near angle; 6, 7 from upper angle.

Proconis abrostoloides, n. sp.

♂. Head and thorax fuscous, the scales pencilled with grey; pectus and legs whitish, the tarsi banded with fuscous; abdomen white, dorsally tinged with fuscous leaving whitish segmental lines. Forewing grey, suffused and irrorated with fuscous brown; a fine curved black subbasal line from costa to vein 1 connected by a streak in submedian fold with the nearly straight antemedial line; reniform large round and indistinctly outlined with black; the postmedial line indistinct, excurved from costa to vein 3, then retracted to below end of cell; an indistinct irregularly waved grey subterminal line; a series of black striæ just before termen and a crenulate terminal line. Hindwing semihyaline, white, with some fuscous at apex and a crenulate terminal line with a series of points just before it.

Hab. **Cape Colony,** Annshaw (Miss F. Barrett). *Exp.* 32 mill. Type in B.M.

Genus CALESIA.

	Type.
Calesia, Guen. Noct. iii. p. 257 (1852) ...	*dasyptera.*
Asymbata, Gerst. von der Decken's Reisen in Ost. Africa iii. p. 377 (1873)	*roseiventris.*

A. Abdomen crimson; forewing with white spots .. .. *roseiventris.*
B. Abdomen dark; forewing without white spots .. .. *phœosoma.*

(1) Calesia sambesita, Wlk. xxxiii. 962 (1865).
,, *roseiventris*, Gerst. von der Decken's Reisen in Ost. Africa iii. p. 378 (1873).
Hab. **British East Africa**, Arthi River, Machakos, Voi, Msokani, Kilima'njaro; **British Central Africa**, Chiromo, Chinde; **Mashonaland**, Zambesi, Salisbury (Marshall); **Natal**, Gadzima (Marshall). *Exp.* 44 mill.

(2) Calesia phæosoma, Hmpsn. Ill. Het. B.M. viii. p. 90, pl. 147, f. 2 (1891).
Hab. **Cape Colony**, Transkei, Annshaw (Miss F. Barrett). **Southern India.** *Exp.* 42–46 mill.

Genus MECODINA.

Type.
Mecodina, Guen. Noct. iii. p. 372 (1852)... ... *lanceola.*

A. Forewing without white bands forming a fork .. .. *subjecta.*
B. Forewing with white bands forming a fork .. .. *furcifera.*

(1) Mecodina subjecta, Wlk. xxxiii. 1012 (1865).
Hab. **Cape Colony** (Dr. Smith). *Exp.* 42 mill.

(2)*Mecodina furcifera, n. sp.
♂. Head, thorax, and abdomen fuscous brown; pectus and legs with rufous hair. Forewing black-brown, the costal area greyish irrorated with brown; a narrow very oblique white band from median nervure near base to middle of inner margin; a similar slightly incurved band from subcostal nervure before end of cell to vein 1, where it is met by a slightly excurved band from vein 7 towards apex, then with short stalk to inner margin, a diffused whitish mark above the outer edge of the Y. Hindwing black-brown.
Hab. **Natal.** *Exp.* 42. mill. Type in Coll. Druce.

Genus MESOGENEA, nov.

Proboscis fully developed; palpi upturned, the second joint smoothly scaled and extending to vertex of head, the third long and naked; antennæ of male ciliated, a tuft of scales on vertex of head; thorax and abdomen smoothly scaled; tibiæ with the spurs very long. Forewing rather narrow; veins 3 and 5 from close to angle of cell; 6 from upper angle; 9 from 10 anastomosing with 8 to form a long and very narrow areole parallel to the cell. Hindwing with

veins 3 and 5 stalked, 4 absent, or 3, 4 stalked, and 5 from angle of cell; 6, 7 from upper angle; 8 running close along the subcostal nervure to near end of cell, the male having an elongate pouch containing a brush of long hair between the two veins on upper side.

Sect. I. Hindwing with veins 3, 5 stalked, 4 absent.

(1) Mesogenea varians, n. sp.

Head and thorax brown, often suffused with black, sometimes with white; pectus, legs, and abdomen white, the tarsi banded with black, the abdomen dorsally tinged with brown. Forewing brown, finely striated with black, sometimes suffused with black on costal area or wholly except on terminal area, the basal area and the costal half to beyond middle sometimes white and the terminal area grey; an antemedial black line sometimes present, angled outwards below costa and on median nervure and inwards in cell, below the cell oblique; a postmedial line sometimes present, very oblique from costa to vein 3, retracted on median nervure to the antemedial line, then very oblique to inner margin, sometimes an indistinct subterminal line present, angled outwards at middle. Hindwing semihyaline white, the veins and termen towards apex tinged with brown.

Hab. **Mashonaland,** Salisbury (Marshall). *Exp.* 24–28 mill. Type in B.M.

Sect. II. Hindwing with veins 3, 4 stalked, 5 from angle of cell.

(2) Mesogenea vinacea n. sp.

Head and thorax purplish red; pectus, legs, and abdomen brownish white. Forewing pale purplish red, irrorated with a few black scales; an indistinct antemedial line angled on median nervure; a black point in middle of cell; an indistinct postmedial line very obliquely curved from costa to vein 4, then retracted to origin of vein 2, then excurved again. Hindwing yellowish white, suffused with brown.

Hab. **Mashonaland,** Umtali (Marshall). *Exp.* 24 mill. Type in B.M.

Genus FODINA.

	Type.
Fodina Guen. Noct. iii. p. 274 (1852)	*oriolus.*

Fodina embolophora n. sp.

♀. Head and thorax dark brown; the base of shaft of antennæ and a bar across vertex of head white; palpi, pectus, and legs pale;

abdomen pale, dorsally suffused with fuscous brown. Forewing pale brown; a white-edged black-brown patch running obliquely from upper angle of cell to inner margin near base and to a sharp point in submedian fold, then retracted with a curve to middle of inner margin; a white-edged dark brown triangular apical patch ending in a point on submedian fold. Hindwing brown with oblique whitish postmedial line from costa to vein 2. Under side pale with the patch of forewing and a broad terminal band to both wings brown.

Hab. **Delagoa Bay** (Mrs. Monteiro). *Exp.* 40 mill. Type in B.M.

Genus BAREIA.

	Type.
Bareia, Wlk. xv. 1840 (1858)	*incidens.*

Bareia incidens Wlk. xv. 1840 (1858).

Hab. **West Africa,** Lagos, Congo; **British East Africa,** Muthambi; **Natal,** Durban (Gueinzius, Bowker, Leigh); **Cape Colony,** Transkei (Miss F. Barrett). *Exp.* 40–50 mill.

Genus THERMESIA.

	Type.
Thermesia, Hübn. Verz. p. 270 (1827) ...	*gemmatalis.*
Tatorinia, Butl. A.M.N.H. (4) xvi. p. 408 (1875)...	*burrowsi.*

Sect. I. Antennæ of male bipectinate.

A. Fore coxæ and femora and mid femora and tibiæ of male clothed with long hair, the hind tibiæ and first joint of tarsi fringed on both sides with long hair, and the next two joints on outer side.

(1) Thermesia atriplaga, Wlk. xv. 1795 (1858).
Toxocampa remota, Wllgrn. Wien. Ent. Mon. iv. p. 174 (1860).
Athyrma anguliplaga, Wlk. xxxiii. 965 (1865).
Hab. **Natal,** Karkloof (Marshall), Durban (Barker, Leigh). *Exp.* 42–46 mill.

B. (*Tatorinia*). Legs of male normal; palpi of female with the second joint long and fringed with long hair above.

(2) Thermesia burrowsi, Butl. A.M.N.H. (4) xvi. p. 408 (1875).
Hab. **Natal,** Durban (Burrows, Leigh). *Exp.* 46 mill.

Sect. II. Antennæ of male ciliated.

A. Fore and mid femora of male with thick fringes of flocculent hair.

(3) Thermesia andersoni, Feld. Reis. Nov. pl. 115, f. 13 (1874).
Hab. **Natal,** Victoria District (Gooch); **Cape Colony,** Annshaw (Miss F. Barrett), Knysna (Trimen). *Exp.* 42 mill.

B. Fore and mid femora of male without fringes of flocculent hair.
a. Forewing with the postmedial line arising from apex .. .. *loxogramma.*
b. Forewing with the postmedial line arising from before apex.
a^1. Forewing with the postmedial line acutely angled outwards below apex .. .. *irrorata.*
b^1. Forewing with the postmedial line straight, oblique.
a^2. Forewing with curved antemedial line .. .. .. *zonaria.*
b^2. Forewing double waved antemedial and dentate medial lines .. .. *hansali.*

(4) Thermesia loxogramma n. sp.
♀. Brownish grey with a slight purple tinge and irrorated with black; palpi black at sides; fore and mid tibiæ and tarsi black. Forewing with waved fuscous antemedial line followed by a black point in the cell; a white discoidal point; a medial fuscous line oblique from costa to discocellulars, then almost obsolete and incurved; an obliquely sinuous fuscous line from costa beyond middle to the straight oblique rufous postmedial line arising from apex; an irregular fuscous subterminal line, angled slightly outwards at vein 7, inwards in discal fold, outwards almost to termen at vein 4, inwards to postmedial line in submedian fold, then outwards to termen; a series of black points just before termen. Hindwing with oblique rufous medial line; an indistinct fuscous highly sinuous subterminal line and series of black points before termen; the under side yellowish white except towards costa and termen and with dark irroration.
Hab. **Mashonaland,** Umtali (Marshall); **Natal,** Durban (Leigh). *Exp.* 38 mill. Type in B.M.

(5) Thermesia irrorata, Fabr. Spec. Ins. ii. p. 506 (1781).
Noctua sordida, Fabr. Ent. Syst. iii. 2, p. 50 (1794).
Thermesia rubricans, Boisd. Faun. Ent. Madag. Lep. p. 106, pl. 16, f. 1 (1833).
Hab. **West Africa,** Sierra Leone, Congo; **Soudan,** White Nile; **Abyssinia; British Central Africa,** Zomba; **Natal,** Durban (Leigh); **Cape Colony** (Sir A. Smith); **Madagascar; Japan; India; Ceylon** and **Burma; Borneo; Java; North Guinea; Pacific groups.** *Exp.* 40–46 mill.

(6) Thermesia zonaria, Dist. A.M.N.H. (7) i. p. 229 (1898).
Hab. **Transvaal,** Pretoria (Distant). *Exp.* 36 mill.

(7) Thermesia hansali, Feld. Reis. Nov. pl. 117, f. 5 (1874).
Hab. **Upper Egypt**; **British East Africa**, Neugia; **Natal**, Durban (Gooch, Leigh); **Cape Colony**, Transkei (Miss F. Barrett). *Exp.* 40 mill.

Auctorum.

Gracillodes amaponda, Feld. Reis. Nov. pl. 119, f. 28 (1874). Type lost ... ... Natal.

Genus ACANTHOLIPES.

Type.
Acantholipes, Led. Noct. Eur. p. 198 (1857)... *regularis*.

A. Forewing with the postmedial line arising from close to apex and slightly incurved.
  a. Both wings with silvery line before the postmedial line .. *trimeni*.
  b. Neither wing with silvery line before the postmedial line .. *circumdata*.
B. Forewing with the postmedial line arising from long before apex, then excurved.
  a. Forewing with the subterminal line slightly curved and with bidentate line beyond it .. .. *annexa*.
  b. Forewing with the subterminal line sinuous and without bidentate line beyond it.
    a^1. Forewing with the medial shade bent outwards round end of cell .. .. *rufirena*.
    b^1. Forewing with the medial shade oblique .. .. *arctinotata*.

(1) Acantholipes trimeni, Feld. Reis. Nov. pl. 108, f. 7 (1874).
Hab. **Mashonaland**, Salisbury (Marshall); **N'Gamiland** (Lugard); **Natal**, Estcourt (Hutchinson). *Exp.* 30 mill.

(2) Acantholipes circumdata, Wlk. xv. 1763 (1858).
Hab. **West Africa**, Nigeria, Congo; **Sokotra**; **British East Africa**, Sabaki Valley, Kinsembo; **British Central Africa**, Nyasa; **Delagoa Bay** (Mrs. Monteiro); **Arabia**; **Western India**. *Exp.* 24–28 mill.

(3)*Acantholipes annexa, Dist. A.M.N.H. (7) i. p. 230 (1898).
Hab. **Transvaal**, Johannesburg (Cregoe). *Exp.* 34 mill.

(4) Acantholipes rufirena, n. sp.
Brownish grey; palpi black, pure white at base; fore and mid tibiæ and tarsi black above. Forewing irrorated with black; the subbasal line represented by dark points below costa and cell; the antemedial line indistinct, waved; the reniform small with ochreous centre and rufous and black outline, rarely filled in with black; the

medial and postmedial lines indistinct, waved, angled outwards beyond upper and lower angles of cell and inwards in discal and submedian folds; the subterminal line ochreous defined by rufous on inner side, sinuous and with slight dentate marks on its outer edge at middle and towards costa; a terminal series of dark points or small lunules. Hindwing irrorated with black with indistinct waved medial, two postmedial and subterminal lines; a fine waved terminal line. Under side of both wings with indistinct curved postmedial line and black suffusion on terminal area.

Hab. **Mashonaland,** Salisbury (Marshall); **Transvaal.** *Exp.* 36 mill. Type in B.M.

(5) Acantholipes arctinotata, Wlk. xxxiii. 989 (1865).
Poaphila biguttata, Wlk. xxxiii. 990 (1865).
Hab. **Cape Colony,** Annshaw, Transkei (Miss F. Barrett). *Exp.* 26 mill.

Genus PARATHERMES, nov.

Type *P. nigriceps.*

Proboscis fully developed; palpi with the second joint porrect, reaching well beyond the frons and fringed with scales above and below, the third upturned, naked, long; frons with tuft of hair; antennæ of male ciliated; mid and hind tibiæ slightly fringed with hair above; abdomen smoothly scaled. Forewing with the apex slightly produced and acute, the termen crenulate; veins 3 and 5 from near angle of cell; 6 from upper angle; 9 from 10 anastomosing with 8 to form the areole; 11 from cell. Hindwing with the termen crenulate; veins 3, 4 from angle of cell; 5 fully developed from a little above angle; 6, 7 from upper angle.

A. Forewing with the postmedial line waved .. .. *nigriceps.*
B. Forewing with the postmedial line not waved.
a. Forewing with the postmedial line angled outwards at veins 6 and 4 .. .. *digoniata.*
b. Forewing with the postmedial line excurved beyond the cell .. *zygia.*

(1) Parathermes nigriceps, Wlk. xv. 1595 (1858).
Herminia nigrifrontalis, Wlk. xvi. 238 (1858).
,, *kerima*, Feld. Reis. Nov. pl. 120, f. 38 (1874).
Renodes pallidula, Butl. A.M.N.H. (4) xvi. p. 409 (1875).
Hab. **West Africa,** Sierra Leone, Nigeria; **Abyssinia; British Central Africa,** Zomba, Likoma; **N'Gamiland** (Lugard); **Natal,** Victoria District (Gooch); **Cape Colony** (Sir A. Smith); **Aden.** *Exp.* 30–40 mill.

(2) Parathermes digoniata, n. sp.

♂. Reddish brown; palpi black, the third joint whitish at base and extremity; legs and abdomen irrorated with fuscous; wings irrorated with black. Forewing with indistinct dark waved antemedial line; a slight dark discoidal lunule; the medial line fuscous, dentate, bent outwards round end of cell, then incurved; the postmedial line brown, defined on outer side by a pale line, angled outwards below costa and obtusely at middle, then oblique; a subterminal series of small black spots, angled outwards at vein 7 and middle; a semicircular patch of dark shading on terminal area from apex to vein 3, at the spots developed into a grey line defined by black; a terminal series of black points. Hindwing with slight dark discoidal mark; an indistinct waved medial line with the slightly sinuous brown postmedial line with a pale line on its outer edge just beyond it; a subterminal series of black points on an indistinct dentate grey line; a fine brown terminal line. Under side of both wings with dark discoidal spot, sinuous postmedial line, maculate subterminal line with dark suffusion beyond it on forewing and at apex of hindwing.

Hab. **Natal,** Karkloof (Marshall). *Exp.* 36 mill. Type in B.M.

(3) Parathermes zygia, Wllgrn. Wien. Ent. Mon. vii. p. 149 (1863).
Thermesia vestispica, Wllgrn. Wien. Ent. Mon. vii. p. 149 (1863).
,, *fuscescens*, Wlk. xxxiii. 1054 (1865).
,, *obumbrata*, Wlk. xxxiii. 1054 (1865).
,, *morosa*, Wlk. xxxiii. 1055 (1865).
Sambina larvata, Wlk. xxxiii. 1119 (1865).
Hab. **Natal,** Victoria District (Gooch), Durban (Leigh); **Cape Colony,** Transkei (Miss F. Barrett). *Exp.* 32–38 mill.

Genus RHANIDOPHORA.

	Type.
Rhanidophora, Wllgrn. Œfv. Vet. Akad. Förh. xv. p. 213 (1858)	*phædonia.*
Enydra, Wlk. Trans. Ent. Soc. (3) i. p. 77 (1862)	*cinctigutta.*

Sect. I. (*Enydra*). Palpi with the third joint long.

A. Forewing with the spots edged with black .. .. *cinctigutta.*
B. Forewing with the spots not black-edged.
a. Forewing grey-brown .. .. *ridens.*
b. Forewing bright orange .. .. *aurantiaca.*

(1) Rhanidophora cinctigutta, Wlk. Trans. Ent. Soc. (3) i. p. 77 (1862).

Isochroa eburneigutta, Feld. Reis. Nov. pl. 100, f. 26.

Hab. **British East Africa,** Machakos; **British Central Africa,** Zomba; **Natal,** Karkloof (Marshall), *Exp.* 36–42 mill.

(2) Rhanidophora ridens, n. sp.

Head, thorax, and abdomen orange fulvous; palpi except at base, antennæ, fore and mid tibiæ and the tarsi fuscous. Forewing pale grey-brown with round white spots at middle and at each angle of cell. Hindwing orange-yellow, with grey-brown terminal band from apex to vein 1, some specimens with the termen towards apex only slightly grey.

Hab. **British East Africa,** Tana River, Machakos (Crawshay); **Delagoa Bay** (H. Junod, de Rougemont). *Exp.* 40–46 mill.

(3) Rhanidophora aurantiaca, n. sp.

♀. Bright fulvous orange; palpi with the extremity of second joint and the third joint black; antennæ, marks on fore tibiæ and the tarsi black. Forewing with round white spots in middle of cell and at each angle, each defined by a slightly darker shade; a subterminal series of white spots in the interspaces. Hindwing clearer orange.

Hab. **Natal,** Durban (Bowker). *Exp.* 46 mill. Type in B.M.

Sect. II. (*Rhanidophora*). Palpi with the third joint short.

(4) Rhanidophora phedonia, Stoll. Pap. Exot. iv. pl. 347, C (1782).

Hab. **Natal,** Estcourt (Hutchinson); **Cape Colony.** *Exp.* ♂ 38, ♀ 44 mill.

Genus HYPOCALA.

	Type.
Hypocala, Guen. Noct. iii. p. 73 (1852)... ...	*deflorata.*

Hypocala deflorata, Fabr. Ent. Syst. iii. p. 472 (1792).

,, *plumicornis*, Guen. Noct. iii. p. 75 (1852).

Hab. **British East Africa,** Kikuyu, Neugia, Kilima'njaro; **Mashonaland,** Salisbury (Marshall); **N'Gamiland** (Lugard); **Natal,** Estcourt (Hutchinson), Durban (Bowker, Gooch, Leigh); **India.** *Exp.* 30–42 mill.

Genus PLUSIODONTA.

Type.

Plusiodonta, Guen. Noct. ii. p. 359 (1852) ... ... *compressipalpis.*

A. Forewing with the basal and terminal areas largely suffused with brassy gold.
  a. Hindwing with the interspaces semihyaline .. .. *commoda.*
  b. Hindwing with the interspaces brown.
    a^1. Forewing without oblique pale diffused band from vein 5 to inner margin before the subterminal line .. .. .. *natalensis.*
    b^1. Forewing with oblique pale diffused band from vein 5 to inner margin before the subterminal line .. .. *walhbergi.*
B. Forewing with the basal and terminal areas dark, slightly tinged with gold .. .. *nictites.*

(1) Plusiodonta commoda, Wlk. xxxiii. 844 (1865).
Hab. **West Africa,** Sierra Leone; **British Central Africa,** Zomba; **Mashonaland,** Salisbury (Marshall). *Exp.* 40 mill.

(2) Plusiodonta natalensis, Wlk. xxxiii. 843 (1865).
,, *detracta*, Wlk. xxxiii. 844 (1865).
,, *tripartita*, Wlk. xxxiii. 845 (1865).
,, *nummaria*, Feld. Reis. Nov. pl. 111, f. 6 (1874).
Hab. **Natal** (Gueinzius, Gooch), Malvern (Marshall). *Exp.* 40 mill.

(3) Plusiodonta walhbergi, Feld. Reis. Nov. pl. 110, f. 27 (1874).
Deva africana, Holl. Psyche, vii. p. 10 (1894).
Hab. **West Africa,** Ogové River; **Natal,** Durban. *Exp.* 30–36 mill.

(4) Plusiodonta nictites, n. sp.

♂. Head and thorax dark brown, slightly mixed with grey; abdomen dark brown. Forewing dark olive-brown; a silvery streak from base of costa to vein 1 at the oblique antemedial line, the area below it purplish; some brassy gold scales on costal area near base; the medial area purplish with an indistinct oblique waved medial line; reniform with dark outline, its inner edge angled inwards at middle; the postmedial line double, bent outwards below costa, oblique to vein 3, then incurved, with golden spots on its outer edge above veins 2 and 3; a dark-edged sinuous subterminal band expanding on inner area and suffused in parts with gold; traces of the two striæ below apex, forming an open **V**. Hindwing fuscous brown.

Hab. **Cape Colony,** Transkei (Miss F. Barrett). *Exp.* 38 mill.

Genus MÆNAS.

Type.

Mænas, Hübn. Verz. p. 264 (1827) ... ... *salamiñia.*
Ophideres, Boisd. Faun. Ent. Madag. Lep. p. 99 (1833) ... ... *fullonica.*

Sect. I. (*Ophideres*). Palpi with the third joint long and spatulate at extremity.

A. Hindwing with black discoidal spot .. .. *materna.*
B. Hindwing without black discoidal spot .. .. *divitiosa.*

(1) Mænas materna, Linn. Syst. Nat. i. 2, p. 840 (1766).
Ophideres chalcogramma, Wlk. xxxiii. 937 (1865).
Hab. **West Africa**, Niger; **Abyssinia**; **British East Africa**, Wadelai, Athi-ya-Mawe; **British Central Africa**; **Zambesi**; **Mashonaland**, Umtali (Marshall); **Natal**, Claremont (Marshall), Durban; **Aden**; **India**, **Ceylon**, and **Burma**; **Java**; **Christmas Island**. *Exp.* 96 mill.

(2) Mænas divitiosa, Wlk. Tr. N. H. Glasg. i. p. 356, pl. vii. f. 11 (1873).
Hab. **West Africa**, Sierra Leone, Accra, Old Calabar, Niger; **British East Africa**, Taro; **British Central Africa**, Zomba; **Natal**, Durban. *Exp.* 100 mill.

Sect. II. (*Mænas*). Palpi with the third joint very short and non-spatulate.

(3) Mænas salaminia, Fabr. Ent. Syst. iii. 2, p. 17 (1792).
Hab. **Cape Colony**, Grahamstown; **Madagascar**; **Japan**; **Formosa**; **India**, **Ceylon**, and **Burma**; **Java**; **Australia**; **Fiji**. *Exp.* 80–104 mill.

Genus CALPE.

Type.

Calpe, Treitsche, Schmett. Eur. v. pl. ii. p. 168 (1825) ... ... *capucina.*

Sect. I. Antennæ of male unipectinate, simple towards apex; forewing with the inner margin excised towards tornus.

1) Calpe provocans, Wlk. xii. 943 (1857).
Oræsia hartmanni, Möschl. Verh. Zool. bot. Ges. Wien. xxxiii. p. 299, pl. xvi. f. 14 (1883).

Orœsia cuprea, Saalm. Lep. Madag. p. 401, f. 238 (1891).
Hab. **West Africa**, Old Calabar; **Delagoa Bay**; **Natal** (Gueinzius, Gooch, Millar); **Cape Colony**, Transkei (Miss F. Barrett); **India**; **Ceylon**. *Exp.* 48 mill.

Sect. II. Antennæ of male bipectinate, simple towards apex; forewing with the inner margin not excised towards tornus.

(2) Calpe hieroglyhica, Saalm. Lep. Madag. p. 405, f. 208 (1891).
Hab. **West Africa**, Niger River; **Natal** Victoria District (Gooch); **Madagascar**. *Exp.* 50–60 mill.

Genus EARIAS.

	Type.
Earias, Hübn. Verz. p. 395 (1827)...	*chlorana.*

A. Forewing with medial and postmedial transverse lines.. .. .. *insulana.*
B. Forewing with a terminal band and no transverse lines .. .. *fulvidana.*

(1) Earias insulana, Boisd. Faun. Madag. p. 121, pl. 16, f. 9 (1833).
„ *plaga*, Feld. Reis. Nov. pl. 118, f. 20 (1874).
Hab. **West Africa**, Sierra Leone; **Egypt**; **Sokotra**; **British East Africa**; **British Central Africa**; **Delagoa Bay** (Kenrick); **Natal** (Gooch); **Cape Colony**, Knysna (Trimen); **Mauritius**; **India**; **Ceylon**; **Burma**; **Marquesas**. *Exp.* 22 mill.

(2) Earias fulvidana, Wllgrn. Wien. Ent. Mon. 1863, p. 143.
„ *chromataria*, Wlk. xxvii. 204 (1864).
Hab. **West Africa**, Sierra Leone; **Natal** (Gooch); **Japan**; **India**; **Ceylon**; **Andamans**; **Java**. *Exp.* 20 mill.

Sub-Family ERASTRIANÆ.

A. Forewing with vein 9 from 10 anastomosing with 8 to form the areole.
a. Abdomen with dorsal crests.
a^1. Frons with rounded prominence with ridge across its middle .. .. *Cnodifrontia.*
b^1. Frons with rounded prominence .. .. *Œderastria.*
c^1. Frons without prominence.
a^2. Thorax with dorsal ridge-like crest .. .. *Perciana.*
b^2. Thorax without dorsal crest.
a^3. Hindwing with veins 3, 4 stalked .. .. .. *Maliattha.*
b^3. Hindwing with veins 3, 4 from cell.

a^4. Forewing with scale-tooth at tornus .. .. *Callopistria.*
b^4. Forewing without scale-tooth at tornus.
a^5. Palpi with the third joint very long and somewhat spatulate .. .. *Sarmatia.*
b^5. Palpi with the third joint moderate.
a^6. Forewing with the apex somewhat produced and acute .. .. *Zurobata.*
b^6. Forewing with the apex not produced .. .. *Erastria.*

b. Abdomen without dorsal crests.
a^1. Frons with rounded or truncate prominence.
a^2. Frons with long lobed plate below the prominence *Megalodes.*
b^2. Frons without lobed plate.
a^3. Forewing with scale-tooth at tornus .. .. .. *Ectalopha.*
b^3. Forewing without scale-tooth at tornus .. .. *Tarache.*
b^1. Frons without prominence.
a^2. Palpi with the third joint upturned.
a^3. Hindwing with veins 3, 4 stalked .. .. .. *Hyela.*
b^3. Hindwing with veins 3, 4 from cell.
a^4. Palpi with pointed tuft of hair at end of second joint .. .. *Tathorynchus.*
b^4. Palpi with the second joint broadly scaled in front.
a^5. Prothorax with spreading crest .. .. *Toxocampa.*
b^5. Prothorax without crest.
a^6. Palpi with the third joint long and acuminate .. .. *Raparna.*
b^6. Palpi with the third joint short and blunt .. .. *Xanthoptera.*
c^4. Palpi with the second joint smoothly scaled in front.
a^5. Forewing with the termen angled at middle .. .. *Cosmophila.*
b^5. Forewing with the termen rounded .. *Callyna.*
b^2. Palpi with the third joint porrect.
a^3. Palpi with the second joint fringed with rough scales in front .. .. *Baniana.*
b^3. Palpi with the second joint smoothly scaled in front.
a^4. Palpi with the second joint smooth above, upturned .. .. *Brevipecten.*
b^4. Palpi with the second joint fringed with hair above, porrect .. .. *Corgatha.*

B. Forewing with veins 9, 10 anastomosing with 8 to form the areole .. .. *Paroruza.*

C. Forewing without areole.
a. Forewing with veins 7, 8, 9, 10 stalked .. .. *Eublemmistis.*
b. Forewing with veins 8, 9, 10 stalked, 7 from cell.
a^1. Frons with beak-shaped prominence .. .. *Neochrostis.*
b^1. Frons without prominence.
a^2. Forewing with the apex not produced .. .. .. *Metachrostis.*
b^2. Forewing with the apex somewhat produced and acute.. .. .. *Eublemma.*
c. Forewing with veins 7, 8, 9 stalked, 10 from cell.. .. .. *Troctoptera.*

Genus CNODIFRONTIA.

Type *C. dissimilis.*

Proboscis fully developed; palpi porrect to just beyond frons, which has a large rounded prominence with raised ridge across it; antennæ of female ciliated; thorax without crests; abdomen with dorsal crest on first segment only. Forewing with the apex rather rounded, the termen obliquely curved, the inner margin strongly curved; veins 3 and 5 from near angle of cell; 6 from upper angle; 9 from 10 anastomosing with 8 to form the areole, 7 from beyond the areole. Hindwing with veins 3, 4 from angle of cell; 5 curved from below angle of discocellulars; 6, 7 shortly stalked; 8 anastomosing with the cell to near middle.

*Cnodifrontia dissimilis, Dist. A.M.N.H. (vii.) i. p. 228 (1898).

Hab. **Transvaal.** *Exp.* 36 mill.

Genus ŒDERASTRIA, nov.

Proboscis fully developed; palpi obliquely upturned, thickly scaled, not reaching vertex of head; frons with rounded prominence; antennæ of male bipectinate with short branches; thorax with crests behind the tegulæ and on metathorax; tibiæ roughly scaled; abdomen with dorsal crests on basal segments, the crest on third segment large. Forewing with veins 3 and 5 from near angle of cell; 6 from upper angle; 9 from 10 anastomosing with 8 to form the areole; 11 from cell. Hindwing with veins 3, 4 from angle of cell; 5 from well above angle; 6, 7 from upper angle.

Œderastria ectorhoda, n. sp.

♂. Head and thorax black-brown slightly mixed with rufous; abdomen black-brown with the dorsal crests and anal tuft rufous. Forewing silky black-brown to the postmedial line, the terminal area pink-madder; the basal area variegated with madder; an oblique black striga on inner margin before the highly sinuous antemedial black line defined by madder on inner side; the orbicular and reniform with black outer line with madder ring inside it; an obscure madder patch below the cell; the postmedial black line strongly bent outwards below costa, dentate to vein 3 then strongly incurved, a fine line parallel to its outer edge with an olive-fulvous dentate line beyond it; a highly crenulate subterminal black line and a blackish spot on costa before apex. Hindwing pure white with a fine brownish terminal line and the cilia brown at apex.

Hab. **Mashonaland,** Salisbury (Marshall). *Exp.* 30 mill. Type in B.M.

Genus PERCIANA.

Type.

Perciana, Wlk. xxxiii. 812 (1856)... ... ... *marmorea.*

Sect. I. Forewing of male with veins 3, 4, 5 approximated for some distance, then 5 curved upwards, and towards termen approximated to 6, which is curved downwards, the termen distinctly excised below apex.

(1) Perciana torsivena, n. sp.

♂. Purplish grey-brown. Forewing with indistinct waved brown subbasal and antemedial lines; an oblique wedge-shaped dark brown pale-edged mark from middle of costa to lower angle of cell, where it ends in a black spot; a minutely waved postmedial line excurved from below costa to vein 3, then incurved; an oblique truncate triangular dark brown pale-edged patch on costa before apex, with two pale points on costa and an indistinct dentate line from it to inner margin; a terminal series of black points. Hindwing brown.

♀. Forewing with the wedge-shaped medial patch shorter, darker, and ending in a larger black spot.

Hab. **West Africa,** Gold Coast, Akrapong Mountains (Carter); **Natal,** Victoria District (Gooch); **Cape Colony** (Dr. Smith). *Exp.* 30 mill. Type in B.M.

This species is closely allied to *P. emarginata,* Hmpsn., from India, which, however, is without the peculiar male neuration of forewing; they differ from the other species of the genus in the palpi being rather shorter, the antennæ nearly simple, the dorsal crests of abdomen slightly developed; the inner margin of forewing lobed near base and the termen of hindwing sinuous below apex.

Sect. II. Forewing of male with the neuration normal, the termen hardly excised below apex.

(2) Perciana lichenosa, n. sp.

♀. Head whitish, black and green between antennæ; palpi irrorated with black and green, the extremity of second joint pinkish; forelegs marked with green and black, the coxæ with red; the tibiæ black with white rings; abdomen white irrorated with black, the dorsal tufts black, small lateral tufts on terminal segments. Forewing sap-green mixed with greyish fuscous and pink; the medial area grey and pale pink; an indistinct double waved

subbasal line; a double black antemedial line excurved at middle, then oblique; an indistinct waved medial line bent outwards in cell; the postmedial line sharply angled outwards beyond upper angle of cell, incurved below vein 3, then sinuous and with a black bracket-shaped mark on it from below costa running obliquely towards middle of termen; two indistinct waved lines beyond the postmedial line; the subterminal line minutely dentate, excurved at middle and white towards costa; cilia green chequered with black. Hindwing with the basal half white, the terminal half black, greyish towards tornus and with traces of waved medial, two postmedial, and a subterminal line; cilia chequered white and black; the under side with discoidal spot and more distinct dentate lines.

Hab. **Mashonaland,** Salisbury (Marshall). *Exp.* 28 mill. Type in B.M.

Genus MALIATTHA.

Type.

Maliattha, Wlk. xxvii. 86 (1863) ... ... *separata.*

A. Forewing with the basal area whitish.
  a. Forewing with brown medial band with dentate edges .. .. *signifera.*
  b. Forewing without medial band, the terminal area brown with oblique inner edge .. .. *vialis.*
B. Forewing with the basal area blackish .. .. *varicolora.*

(1) Maliattha signifera, Wlk. xii. 793 (1857). Moore, Lep. Ceyl. iii. pl. 150, f. 4.

Tarache perta, Schaus, Lep. S. Leone, p. 36, pl. iii. f. 10 (1893).

Hab. **West Africa,** Sierra Leone; **Abyssinia; British East Africa,** Teita; **Natal** (Gooch), Malvern (Marshall); **Japan; China; India, Ceylon,** and **Burma; Andamans; Christmas Island; Australia.** *Exp.* 18 mill.

(2) Maliattha vialis, Moore, Lep. Atk. p. 135 (1879).

Hab. **Cape Colony,** Transkei (Miss F. Barrett); **India.** *Exp.* ♂ 20, ♀ 22 mill.

(3) Maliattha varicolora, n. sp.

Head, thorax, and abdomen greyish ochreous strongly irrorated and suffused with black; anal tuft of male ochreous. Forewing with the basal area black, slightly mixed with grey; the medial area grey, irrorated and suffused with black, or in the Natal specimen flesh pink irrorated with olive and a few black scales from costa to submedian fold; the orbicular and reniform large, indistinct, greyish

with dark outline and centre, suffused with pink in the Natal specimen; the postmedial line fine indistinct double, minutely waved, strongly bent outwards below costa, slightly angled inwards at vein 5, strongly incurved and whitish below vein 3; the area beyond it blackish to the irregularly dentate subterminal line which is strongly dentate inwards and white in submedian fold; the termen olive-green; a fine terminal black line; the cilia grey and fuscous with a black patch at middle. Hindwing greyish suffused with fuscous black, very strongly so in female; traces of a discoidal point and of a postmedial line which is curved from costa to vein 3, then incurved, on under side more distinct and crenulate; cilia greyish and fuscous.

Hab. **Natal,** Karkloof (Marshall); **Cape Colony,** Transkei (Miss F. Barrett). *Exp.* 24 mill.

Genus CALLOPISTRIA.

Type.

Callopistria, Hübn. Verz. p. 216 (1827) *purpureofascia.*

A. Forewing with white patch on apical part of termen .. .. .. *insularis.*
B. Forewing with short oblique white streaks from apex and middle of termen .. .. *recurvata.*
C. Forewing with double lunulate subterminal line .. .. *latreilli.*

(1) Callopistria insularis, Butl. A.M.N.H. (5) x. p. 230 (1882).
Hab. **Natal,** Karkloof (Marshall); **Burma; Borneo; New Hebrides; Solomons.** *Exp.* 26–30 mill.

(2) Callopistria recurvata, Moore, Lep. Atk. p. 144 (1879); id. Lep. Ceyl. iii. pl. 151, f. 1.
Hab. **Sokotra; Natal,** Durban (Leigh); **Cape Colony,** Tole River (Miss F. Barrett); **China, India, Ceylon,** and **Burma; Java; New Guinea; New Hebrides.** *Exp.* 40 mill.

(3) Callopistria latreilli, Dup. Lep. Fr. Noct. iv. pt. 1, p. 327, pl. 120, f. 2 (1823).
Hab. **Southern Europe; West Africa,** Congo; **British East Africa,** Neugia, Eb. Urru; **Natal,** Durban (Leigh); **India.** *Exp.* 26 mill.

Genus SARMATIA.

Type.

Sarmatia, Guen. Delt. and Pyr. p. 25 (1854) *interitalis.*

Sarmatia interitalis, Guen. Delt. and Pyr. p. 25, pl. 5, f. 1 (1854).

Suma incongrualis, Wlk. xxxiv. 1197 (1865).

Hab. **British East Africa,** Eb.Urru; **Cape Colony** (Dr. Smith), Annshaw (Miss F. Barrett), Uitenhage (Banistow). *Exp.* 34 mill.

Genus ZUROBATA.

Type.
Zurobata, Wlk. xxxiv. 1276 (1865) ... ... *rorata.*

A. Forewing with curved white subapical line .. .. *lithina.*
B. Forewing without curved white subapical line .. .. *latifera*

(1) Zurobata lithina, Holl. Psyche, vii. p. 113 (1894).

Hab. **West Africa,** Aburi, Beinto; **Natal,** Victoria District (Gooch). *Exp.* 26 mill.

(2) Zurobata latifera, Wlk. Proc. N.H. Soc. Glasg. i. p. 375 (1869).

Selenis costalis, Butl. A.M.N.H. (4) xvi. p. 408 (1875).

Hab. **West Africa,** Congo; **Natal** (Burrows). *Exp.* 22 mill.

Genus ERASTRIA.

Type.
Erastria, Ochs. Eur. Schmett. iv. p. 92 (1816) *fasciana.*

A. Forewing with round whitish discoidal spot.
  a. Forewing with ochreous brown antemedial band .. .. *leucoglene.*
  b. Forewing without ochreous antemedial band .. .. .. *binorbis.*
B. Forewing with the reniform fuscous brown defined by black and connected by a streak with the postmedial line .. .. *quadrimaculata.*

(1) Erastria leucoglene, Mab. Bull. Soc. Ent. Belge, 1880, p. xvii.

Hab. **British East Africa,** Tangani; **Natal,** Malvern (Marshall), Durban (Bowker, Leigh); **Madagascar.** *Exp.* 18 mill.

(2) Erastria binorbis, n. sp.

♀. Head and thorax ochreous; palpi mostly black at sides; tegulæ in front and patagia and metathorax behind with some black and brown scales; tarsi banded with black; abdomen ochreous mixed with fuscous brown. Forewing ochreous tinged with rufous and irrorated with black; a curved black subbasal line from costa to submedian fold; a double antemedial line angled outwards below costa and excurved from cell to inner margin; claviform defined by black; orbicular and reniform brownish white defined by black, the former oblique elliptical, a diffused black medial shade passing

between them; the postmedial line double, minutely waved, bent outwards below costa, angled outwards in discal fold and inwards in submedian fold; the subterminal line indistinct, pale, defined on each side by diffused fuscous, angled outwards at vein 7 and excurved at middle; a fine terminal line; cilia intersected with black. Hindwing fuscous; the under side whitish irrorated with brown, an indistinct sinuous postmedial line and diffused subterminal line.

Hab. **Cape Colony,** Transkei (Miss F. Barrett). *Exp.* 26 mill. Type in B.M.

(3) Erastria quadrimaculata, Mab. Ann. Soc. Ent. Fr. 1888, p. 729.

Hab. **East Africa; Natal** coast belt (Barker). *Exp.* 34 mill.

Auctorum.

Erastria varipalpis, Wlk. xxxiii. 792 (1865).
Type lost... ... ... South Africa.

Genus MEGALODES.

	Type.
Megalodes, Guen. Noct. ii. p. 261 (1852)	*eximia.*
Metaplioplasta, Wllgrn. Kongl. Svensk. Vet. Akad. Handl. v. 3, p. 70 (1864)	*insocia.*

Sect. I. Frons with the process trilobate at extremity; antennæ of male nearly simple.

A. Wings with the ground-colour ochreous.
  a. Forewing with large rounded patches on basal and apical areas shaded with brown .. .. *achatina.*
  b. Forewing without rounded patches on basal and apical areas shaded with brown .. .. *obsita.*
B. Wings with the ground-colour white .. .. *insocia.*

(1) Megalodes achatina, Weymer. Berl. Ent. Zeit. 1896, p. 90.

Hab. **Central Africa; Natal,** Estcourt (Hutchinson). *Exp.* 34 mill.

(2) Megalodes obsita, Feld. Reis. Nov. pl. 108, f. 39 (1874).

Hab. **Cape Colony,** Capetown (Trimen). *Exp.* 26 mill.

(3) Megalodes insocia, Wlk. xii. 788 (1857).
Acontia concinnula, Wlk. xii. 789 (1858).
,, *pyralina*, Wlk. xii. 789 (1857).

Metaplioplasta simo, Wllgrn. Wien. Ent. Mon. iv. p. 17 (1860).
Acontia cornifrons, Auriv. Œfv. Ak. Förh. xxxvi. (7) p. 66 (1879).
Tarache porphyria (♀), Butl. P.Z.S. 1898, p. 420.
Hab. **West Africa,** Sierra Leone; **Sokotra; British East Africa,** Athi-y-Mawe; **Damaraland; N'Gamiland** (Lugard); **Cape Colony; Ceylon.** *Exp.* 34 mill.

Sect. II. Frons with the process bilobed at extremity.

A. Antennæ of male bipectinate.

(4) MEGALODES PIENAARI, Dist. A.M.N.H. (7) i. p. 223 (1898).
Hab. **Mashonaland,** Salisbury (Marshall); **Transvaal,** Pienaar River. *Exp.* 30 mill.

B. Antennæ of male uniserrate.
a. Forewing with the pale apical patch extending to vein 2 .. *bucephalidia.*
b. Forewing with the pale apical patch not extending to vein 3 *galactiplaga.*

(5) MEGALODES BUCEPHALIDIA, n. sp.
♂. Head and thorax pale purplish grey; antennæ brown; abdomen yellowish white. Forewing pale purplish grey; two indistinct lines from costa beyond middle, very oblique to upper edge of cell, then less oblique, angled outwards below the cell, then again oblique; a large buff-coloured terminal patch extending from apex to submedian fold, its inner edge rounded and including the large reniform stigma, which is defined by a curved dark brown mark on inner side and by rufous suffusion on outer; the submedian fold streaked with brown towards termen; a brown terminal line; the cilia chequered brown and grey. Hindwing whitish strongly tinged with brown; a fine brown terminal line.
Hab. **N'Gamiland** (Lugard); **Natal** coast belt (Barker). *Exp.* 26 mill.

(6) MEGALODES GALACTIPLAGA, n. sp.
♀. Head and thorax red-brown; tegulæ ochreous; abdomen ochreous and brown. Forewing pale brownish ochreous mottled with purplish brown; a subbasal dark line from costa to submedian fold; the antemedial line oblique from costa to submedian fold, dentate inwards on vein 1 and outwards above inner margin; the orbicular greyish with pale annulus partially defined at sides by black and with an obliquely curved black line from it to submedian fold; the reniform a large cream-coloured lunule with rufous centre,

the area between it and the dentate postmedial line blackish, the line being incurved to costa and below vein 3; a large elliptical cream-coloured apical patch extending to above vein 3, traversed by the diffused dentate brown subterminal line bent inwards to a blackish patch on costa and the pale patch defined below by a curved black streak. Hindwing ochreous suffused with fuscous brown; the under side whitish irrorated with dark brown, a discoidal spot and post-medial line incurved below vein 3.

Hab. **Natal,** Victoria District (Gooch). *Exp.* 40 mill. Type in B.M.

C. Antennæ of male ciliated.

(7) Megalodes similis, n. sp.

♂. Head and thorax purplish grey; pectus and legs black-brown and whitish; abdomen yellowish white irrorated with dark brown. Forewing purplish grey suffused at base and on costal and inner areas with brown; the orbicular an elongate lunule with brown and ochreous centre, an oblique black line on an ochreous band from it to inner margin emitting black streaks on vein 2 and in submedian fold; a large ochreous patch on terminal area from apex to submedian fold, its inner edge rounded and including the large reniform stigma which is defined by a curved dark brown mark on its inner side, by rufous suffusion on outer, with some rufous on it and with two short blackish streaks from its upper extremity; the patch has the area below it brown and a curved subterminal line on it from costa to vein 4; a fine terminal line; cilia grey with a blackish line through them. Hindwing yellowish white irrorated with brown scales and with a fine brown terminal line.

Hab. **Mashonaland,** Salisbury (Marshall). *Exp.* 24 mill. Type in B.M.

Auctorum.

Metoplioplasta silus, Wllgrn. Œfv. af. k. Vet. Akad. Förh. 1875, p. 111 ... ... Transvaal.

Genus ECTOLOPHA, nov.

Proboscis fully developed; palpi upturned, rather slender, reaching vertex of head; frons with rounded prominence; antennæ of male laminate and minutely serrate; thorax with crest behind collar and sharp dorsal crest; mid and hind tibiæ fringed with long hair; abdomen smoothly scaled. Forewing with scale tooth at tornus;

veins 3 and 5 from near angle of cell; 6 from upper angle; 9 from 10 anastomosing with 8 to form the areole; 11 from cell. Hindwing with veins 3, 4 from angle of cell; 5 from well above angle; 6, 7 from upper angle.

Ectolopha viridescens, n. sp.

♀. Head and tegulæ whitish, the palpi, frons, and a streak on vertex fuscous; antennæ brown; thorax yellow-green; abdomen whitish with dorsal segmental orange lines or dorsally suffused with orange. Forewing yellow-green, the costa streaked with fuscous; a fuscous patch on middle of costa usually present; a yellowish white patch on middle of inner margin edged with rufous; the postmedial line fuscous, oblique from costa to vein 6, curved and dentate to vein 2, then strongly incurved and rufous where it traverses the yellowish patch, a fuscous patch beyond lower angle of cell on inner side of the line; traces of a minutely dentate subterminal line often with some small whitish spots on it towards apex; cilia fuscous. Hindwing fuscous, yellowish white at base and on inner area.

Hab. **British East Africa,** Kikuyu (Crawshay); **Mashonaland.** Salisbury (Marshall). *Exp.* 40 mill. Type in B.M.

Genus TARACHE.

Type.

Tarache, Hübn. Verz. p. 261 (1827) ... ... *lucida.*

Sect. I. Antennæ of male bipectinate with short branches.

(1) Tarache annulella, n. sp.

White; palpi, lower part of frons, antennæ, and abdomen tinged with red-brown; tibiæ and tarsi brown. Forewing irrorated with a few large brown scales; the basal half of costa streaked with brown; an antemedial brown patch on inner margin; the orbicular lunulate, indistinct, its centre tinged with yellow; a red-brown lunule before and below the inverted-comma-shaped reniform; the terminal area tinged with ochreous; three minute black annuli on costa towards apex; an oblique rufous patch from apex with an indistinct dentate line arising from it and a blackish mark beyond it on inner area; the termen rufous with irregularly sinuous pale subterminal line. Hindwing yellowish white suffused with brown and with indistinct waved brown postmedial line.

Hab. **Mashonaland,** Salisbury (Marshall); **Cape Colony,** Heald Town (Miss F. Barrett). *Exp.* 24–30 mill.

Sect. II. Antennæ of male ciliated.

A. Frons with truncate conical prominence with raised rim at extremity.
a. Frontal prominence long, its lower edge produced to a point.

(2) Tarache sphendonistis, n. sp.

♀. Head black; palpi white below; thorax pure white; tibiæ and tarsi banded with black; abdomen white with fuscous dorsal lines, the anal tuft ochreous. Forewing white; the basal area with numerous blue-grey splotches; triangular black medial and postmedial spots on costa; a black hoop open below just beyond the cell; the terminal area olive- and grey-brown, its inner edge angled inwards at vein 6 nearly to the hoop and at vein 2 to before middle of wing; the postmedial line indistinct and dentate beyond the cell, below the cell bent inwards to middle of wing and black with some cupreous scales on its outer edge; the subterminal line indistinct dentate, bent inwards and cupreous below vein 2, with a white point at costa, some white irroration below apex and below middle a disintegrated white patch on termen and cilia; a terminal series of black lunules with two spots at apex and one above tornus. Hindwing brownish black with white postmedial spot on costa; cilia white, fuscous at apex; under side white with obsolescent fuscous antemedial band, discoidal spot, maculate postmedial band excurved beyond cell and the terminal area black.

Hab. **Natal,** Estcourt (Hutchinson); **Basutoland,** Maseru (Crawshay). *Exp.* 40 mill. Type in B.M.

b. Frontal prominence short, its lower edge not produced.
*a*¹. Frontal prominence large.

(3)*Tarache accola, Feld. Reis. Nov. pl. 108, f. 22 (1874).

Hab. **Cape Colony,** Capetown. *Exp.* 30 mill.

*b*¹. Frontal prominence minute.

(4)*Tarache semiplumbea, n. sp.

♀. Head, tegulæ, and outer part of patagia white; antennæ brown except towards base; thorax fuscous brown; abdomen dorsally brown, ventrally white. Forewing white, the inner half dark leaden grey to the broad oblique subterminal band with irregularly sinuous edges, the inner area expanding into a small spot in middle of cell; three points on costa; a terminal series of black points and a black patch on cilia above middle. Hindwing white tinged with brown, especially towards termen; cilia white; the under side white

with black discoidal spot, curved brown subterminal line obsolete towards inner margin and fuscous terminal band from costa to vein 3 towards which it becomes obsolescent and maculate.

Hab. **Cape Colony,** Bedford (M. Weale). *Exp.* 50 mill. Type in Coll. Druce.

B. Frons with rounded prominence.
  a. Hindwing of male with the ground colour pure white.
    a^1. Forewing with oblique white band from costa before apex to base of inner margin .. .. *catena.*
    b^1. Forewing without oblique white band from costa before apex.
      a^2. Forewing with oblique dark band from base of costa *umbrigera.*
      b^2. Forewing without oblique dark band from base of costa.
        a^3. Forewing with the postmedial white patch produced on costa to a point.
          a^4. Forewing with oblique dark medial band from costa .. .. *margaritata.*
          b^4. Forewing without oblique dark medial band from costa .. .. *wahlbergi.*
        b^3. Forewing with the postmedial white patch truncate towards apex.
          a^4. Head wholly black.
            a^5. Anal tuft orange.. .. .. *chrysoproctis.*
            b^5. Anal tuft white .. .. *caffraria.*
          b^4. Head with some white on vertex .. .. .. *antica.*
  b. Hindwing of male orange or yellow.
    a^1. Forewing white and black-brown.
      a^2. Forewing with quadrate white postmedial spot with dark band before it .. .. *triphœnoides.*
      b^2. Forewing with the postmedial white markings on costa conjoined to the basal markings.
        a^3. Metathorax with large tuft of black scales .. *hyperlophia.*
        b^3. Metathorax without tuft of black scales.
          a^4. Head wholly black.
            a^5. Forewing with the terminal band angled inwards above vein 5.. .. .. *gradata.*
            b^5. Forewing with the terminal band not angled inwards above vein 5 .. .. .. *spangbergi.*
          b^4. Head with the lower part of frons and vertex in male whitish.
            a^5. Forewing with small black discoidal bar *dispar.*
            b^5. Forewing with rounded grey orbicular and reniform stigmata .. .. *natalis.*
            c^5. Forewing with the orbicular almost obsolete, the reniform greyish.
              a^6. Hindwing with the terminal band narrowing on tornal area in female.. *wallengreni.*
              a^6. Hindwing with the terminal band expanding on tornal area in female *crocata.*
    b^1. Forewing yellowish and black-brown.
      a^2. Forewing with the costal fascia not expanding to inner margin at base .. .. *bidentata.*

b^2. Forewing with the costal fascia expanding to inner margin at base in male .. .. *guttifera.*

c. Hindwing of male brownish white.

a^1. Forewing with the basal half white, the stigmata with black outlines.

a^2. Forewing with grey discoidal patch, the stigmata obsolescent .. .. *eulepidea.*

b^2. Forewing without grey discoidal patch .. .. .. *discoidea.*

b^1. Forewing with the basal half yellowish white, the stigmata grey .. .. *tropica.*

c^1. Forewing with the basal half clouded with olive-grey, the stigmata large .. .. *nubilata.*

d^1. Forewing with the basal half clouded with brown.

a^2. Forewing with the stigmata large .. .. *leucostigmata.*

b^2. Forewing with the stigmata small.

a^3. Forewing with the veins of costal area streaked with brown .. .. *torrefacta.*

b^3. Forewing with the veins of costal area not streaked with brown.

a^4. Forewing with distinct oblique band arising from apex .. .. *flavitermina.*

b^4. Forewing with obscure brown band from before apex, with ochreous line on its outer edge .. .. *griseola.*

e^1. Forewing with the basal half grey.

a^2. Forewing with white stripe in submedian interspace *rectiradiata.*

b^2. Forewing with black streak in medial part of submedian fold .. .. *connectens.*

(5) Tarache catena, Sowerby Brit. Misc. p. 29, pl. 14 (1806).

Hab. **Abyssinia**; **Natal**, Victoria District (Gooch); **India**; **Burma**. *Exp.* 40 mill.

(6) Tarache umbrigera, Feld. Reis. Nov. pl. 108, f. 34 (1874).

Acontia trimaculata, Auriv. Œfv. Ak. Förh. xxxvi. (7) p. 60 (1879).

Hab. **British East Africa**, Tsaro; **Angola**, Kisembo; **Damaraland**; **N'Gamiland** (Lugard); **Cape Colony**, Murraysberg (Trimen). *Exp.* 34 mill.

(7) Tarache margaritata, Drury Ill. Exot. Ins. iii. pl. 21, f. 6 (1782).

Acontia bohemanni, Wllgrn. Auteckn. i. Zool. i. p. 58 (1856).

,, *monilifera*, Wlk. xii. 798 (1857).

,, *unio*, Feld. Reis. Nov. pl. 108, f. 32 (1874).

Hab. **Natal** (Gooch, Trimen). *Exp.* 40 mill.

(8) Tarache wahlbergi, Wllgrn. Auteckn. i. Zool. i. p. 58 (1856).

Acontia urbani, Feld. Reis. Nov. pl. 108, f. 35 (1874).

Hab. **West Africa,** Accra; **British East Africa,** Sabaki Valley; **Natal,** Isilpingo (Marshall), Durban (Gooch, Leigh, Trimen). *Exp.* 32 mill.

(9) Tarache chrysoproctis, n. sp.

♂. Head black; palpi white below; thorax pure white, tibiæ and tarsi banded with black; abdomen white with fuscous dorsal bands, the anal tuft orange. Forewing white; two short blue-grey subbasal lines; two waved pale green antemedial lines followed by a green patch on costa and short streak above median nervure; a black discoidal point; a small triangular green postmedial spot on costa; the terminal area purple-grey shading to sap-green on its inner edge, which is slightly angled inwards at vein 5 where it is joined by a short green striga, at vein 3 angled inwards to middle; a medial black spot below vein 2; an indistinct waved black subterminal line with some blue-grey irroration beyond it and a black spot on inner margin; a white patch on termen below middle and cilia from middle to just above tornus. Hindwing pure white with terminal black band narrowing from costa to a point at vein 1; the under side with postmedial spot on costa.

Hab. **Mashonaland,** Salisbury (Marshall). *Exp.* 36 mill. Type in B.M.

(10) Tarache caffraria, Cram. Pap. Exot. ii. p. 82, pl. 174 F. (1779).
Acontia komaga, Feld. Reis. Nov. pl. 108, f. 33 (1874).
Hab. **Natal,** Estcourt (Hutchinson), Durban (Bowker, Leigh); **Cape Colony,** Knysna, Capetown (Trimen). *Exp.* 36 mill.

(11) Tarache antica, Wlk. Trans. Ent. Soc. (3) i. p. 90 (1862).
Hab. **Natal,** Durban (Leigh). *Exp.* 24 mill.

(12) Tarache triphænoides, Wllgrn. Auteckn. i. Zool. i. p. 59 (1856).
Acontia lituri fera, Wlk. xxxiii. 784 (1865).
,, *trimenii,* Wllgrn. Œfv. Ak. Förh. 1875, p. 110.
Hab. **Mashonaland,** Salisbury (Marshall); **Transvaal** (Marshall); **Natal,** Newcastle, Estcourt (Hutchinson); **Cape Colony,** Annshaw (Miss F. Barrett). *Exp.* 34–38 mill.

(13) Tarache hyperlophia, n. sp.

♂. Head and thorax white; palpi at extremity, a band across frons and antennæ black; metathorax with a tuft of glossy black scales; abdomen yellow with short dorsal black bands and lateral

points, the ventral surface white. Forewing white, a subbasal grey striga from costa; two waved antemedial lines arising from costal spots, the inner obsolescent towards costa and with a spot on inner margin; medial and postmedial grey spots on costa; the orbicular and reniform grey-edged; the postmedial line grey, dentate, angled outwards on veins 6 and 4, then strongly incurved, with a large olive-brown and grey patch beyond it on apical area, a smaller patch before and beyond it at middle with two dentate black marks before the line and a large quadrate patch before and beyond it from vein 3 to inner margin, these patches partly confluent with terminal patches at middle and tornus; a terminal series of black points; cilia grey with some white above and below middle. Hindwing bright yellow; a more or less developed blackish discoidal point and an obsolescent terminal band from apex to vein 2.

♀. Forewing with dark markings beyond the antemedial line conjoined on inner area to the dark patch on postmedial line. Hindwing with the terminal band more developed.

Hab. **Transvaal** (Ross); **Natal,** Weenen, Estcourt (Hutchinson); **Cape Colony,** Transkei (Miss F. Barrett). *Exp.* 28–30 mill.

(14) Tarache gradata, Wlk. xii. 788 (1857).

Hab. **Natal** coast belt (Barker); **Cape Colony,** Grahamstown (Drège). *Exp.* 38 mill.

(15)*Tarache spangbergi, Auriv. Œfv. Ak. Förh. xxxvi. (7) p. 62 (1879).

Hab. **Damaraland.** *Exp.* 30 mill.

(16) Tarache dispar, Wlk. xii. 790 (1857).

Hab. **Natal,** Newcastle, Estcourt (Hutchinson); **Basutoland,** Maseru (Crawshay); **Cape Colony,** Grahamstown (Trimen). *Exp.* 32 mill.

(17) Tarache natalis, Guen. Noct. ii. p. 217 (1852).

Acontia parilis, Wllgrn. Auteckn. i. Zool. i. p. 60 (1856).

,, *adulterina*, Wllgrn. Auteckn. i. Zool. i. p. 60 (1856).

,, *guttistrigata*, Wlk. xxxiii. 784 (1865).

,, *formosa*, Butl A.M.N.H. (4) xvi. p. 404 (1875).

rectangularis, Auriv. Œfv. Ak. Forh. xxxvi. (7) p. 64 (1879).

Hab. **British East Africa,** Kikuyu, Eb. Urru; **Damaraland;** **Transvaal,** Johannesburg (Rose); **Natal,** Weenen, Estcourt (Hutchinson); **Basutoland,** Maseru (Crawshay); **Cape Colony,** Transkei (Miss F. Barrett), Grahamstown. *Exp.* 28 mill.

(18)*Tarache wallengreni, Auriv. Œfv. Ak. Förh. xxxvi. (7) p. 61 (1879).
Hab. **Damaraland.** *Exp.* 32 mill.

(19) Tarache crocata, Guen. Noct. ii. p. 218 (1852).
Hab. **British East Africa,** Machakos; **Mashonaland,** Salisbury (Marshall); **Formosa; India; Burma.** *Exp.* 22 mill.

(20) Tarache bidentata, n. sp.
Head and tegulæ grey-brown; patagia and thorax chocolate-brown; pectus and legs orange-yellow and dark brown; abdomen orange-yellow dorsally suffused with fuscous. Forewing deep chocolate-brown; an ochreous costal fascia whitish towards lower edge which is dentate at middle and end of cell and tapering to a point just before apex; an indistinct black postmedial line, minutely dentate, oblique from costa to vein 3 then bent inwards to below end of cell. Hindwing orange-yellow with rather broad diffused fuscous terminal band.
Hab. **Mashonaland,** Salisbury (Marshall). *Exp.* 30 mill. Type in B.M.

(21) Tarache guttifera, Feld. Reis. Nov. pl. 108, f. 26 (1874).
Hab. **Angola,** Ambriz; **Delagoa Bay** (Mrs. Monteiro); **Natal,** Victoria District (Gooch), Durban (Bowker). *Exp.* 24 mill.

(22) Tarache eulepidea, Hmpsn. Moths Ind. iv. p. 514 (1896)
Hab. **N'Gamiland** (Lugard); **Ceylon.** *Exp.* 22 mill.

(23) Tarache discoidea, Hoffn. Peter's Reise Moz. p. 433, pl. 28, f. 9 (1862).
Catophasia upsilon, Wlk. xxxiii. 763 (1865).
Hab. **West Africa,** Congo; **Angola,** Ambriz; **British East Africa,** Sabaki Valley, Kilima'njaro, Samburu; **N'Gamiland** (Lugard); **Natal,** Durban (Leigh); **India.** *Exp.* 30 mill.

(24) Tarache tropica, Guen. Noct. ii. p. 217 (1852). Moore, Lep. Ceyl. iii. pl. 150, f. 2.
Acontia transfigurata, Wllgrn. Auteckn. i. Zool. i. p. 59 (1856).
,, *zelleri,* Wllgrn. Auteckn. i. Zool. i. p. 59 (1856).
,, *gratiosa,* Wllgrn. Auteckn. i. Zool. i. p. 59 (1856).
,, *imitatrix,* Wllgrn. Auteckn. i. Zool. i. p. 59 (1856).
,, *tinctilis,* Wllgrn. Œfv. Ak. Förh. 1875, p. 109.

Hab. **British East Africa,** Teita; **Transvaal**; **Natal,** Victoria District (Gooch); **Cape Colony,** Caffraria; **China**; **Formosa**; **India, Ceylon,** and **Burma**; **Borneo**; **Java**; **Celebes.** *Exp.* 23 mill.

(25) Tarache nubilata, n. sp.

♂. Head and thorax white; palpi at tips, sides of frons, and vertex of thorax tinged with fuscous; forelegs banded with brown; abdomen pale yellowish brown above, white below. Forewing white very largely clouded with grey-brown; the base of inner area white; the costal area white except at base and apex, its medial part clouded with brown; the orbicular and reniform round grey, partly defined by white and with short white streaks before the former and below the latter; the antemedial line indistinct, very oblique from costa to orbicular, then inwardly oblique; the postmedial line strongly excurved beyond the reniform, then incurved and blackish; the termen white with a series of black points; traces of an irregularly sinuous subterminal line incurved and dentate below vein 2 and with a blackish spot with yellowish patch beyond it at tornus; cilia with brown patches at apex and above and below middle. Hindwing yellowish white with some brown suffusion on terminal area.

Hab. **Natal,** Durban (Gooch). *Exp.* 30 mill. Type in B.M.

(26) Tarache leucostigmata, n. sp.

♀. Head and thorax grey irrorated and clouded with fuscous; pectus, legs, and abdomen pale ochreous irrorated with dark brown. Forewing grey slightly irrorated with black and strongly clouded with dark brown, especially on medial area; the antemedial line black with a brown line on its inner edge, angled outwards on median nervure, inwards in submedian fold and excurved to inner margin; the orbicular moderate in size, white and pointed; the reniform large whitish; the postmedial line black with grey line on its outer edge, oblique from costa to vein 6, then minutely waved, angled outwards on vein 4, then incurved; a diffused whitish subterminal line, slightly angled outwards at vein 6 and with the area beyond it rufous; a terminal series of blackish points; cilia mixed grey and black. Hindwing ochreous whitish, heavily or almost completely suffused with brown and with indistinct curved fuscous postmedial and diffused subterminal lines; a terminal series of black points.

Hab. **Cape Colony,** Transkei (Miss F. Barrett), Capetown (Trimen). *Exp.* 38 mill.

(27) Tarache torrefacta, Dist. A.M.N.H. (7) i. p. 223 (1898).
Hab. **British East Africa,** Eb. Urru; **Transvaal** (Ross). *Exp.* 28 mill.

(28) Tarache flavitermina, n. sp.

♂. Head, thorax, and abdomen grey-white irrorated with brown; forelegs brown above. Forewing with the base of inner area and the costal area to the postmedial line brownish grey irrorated with brown; the rest of wing brown to the postmedial line with a black point representing the orbicular and a small dark-edged reniform; the postmedial line strongly excurved below costa, then becoming very oblique and forming the inner edge of the oblique purplish brown band from apex which expands at inner margin; the subterminal line excurved below costa then forming a dentate yellow outer edge to the brown band; the terminal area yellow with some red-brown suffusion and a terminal series of black points; cilia purplish grey, yellowish above tornus. Hindwing yellowish white suffused with brown; a discoidal point, the veins, and a diffused terminal line brown.

Hab. **Cape Colony,** Annshaw (Miss F. Barrett). *Exp.* 28 mill. Type in B.M.

(29) Tarache griseola, Feld. Reis. Nov. pl. 108, f. 10 (1874).
Hab. **Cape Colony,** Plettenberg Bay, Knysna (Trimen). *Exp.* 28–30 mill.

(30) Tarache rectiradiata, n. sp.

♀. Head, tegulæ, patagia, and metathorax pale brown mixed with black, vertex of thorax grey; pectus, legs, and abdomen ochreous white, streaks on tibiæ and the tarsi blackish, the abdomen dorsally irrorated with brown. Forewing bluish grey; a yellowish white fascia below the cell and vein 2 from base to near termen with blackish streaks on its edges; two somewhat oblique black streaks on inner area; the orbicular and reniform small, black-edged, whitish and with dark scales at centre; the veins of terminal area streaked with black; yellowish white streaks above and below basal part of vein 5 and an apical spot; a bluish white fascia on each side of vein 6; a crenulate black line just before termen with dentate whitish marks on it; cilia chequered yellowish white and black. Hindwing ochreous tinged with fuscous, the veins streaked with fuscous and the terminal area fuscous; cilia whitish.

Hab. **N'Gamiland** (Lugard). *Exp.* 30 mill. Type in B.M.

(31) Tarache connectens, n. sp.

♀. Head and thorax grey mixed with brown and fuscous; pectus and legs whitish, fore tibiæ and the tarsi banded with black; abdomen brown, whitish below. Forewing clothed with white, grey, and brown scales; a slight black streak in base of submedian fold; the antemedial line represented by an oblique striga from costa and slight streaks in cell and above and below vein 1; a prominent streak in medial part of submedian fold connecting the ante- and post-medial lines; orbicular defined above by black and connected with the black inner edge of the reniform, which is otherwise obsolete, by a black streak; the postmedial line excurved from costa to vein 3, then strongly incurved and at vein 4 traversed by a black streak. Hindwing white, the marginal areas strongly tinged with brown.

Hab. **N'Gamiland** (Lugard). *Exp.* 28 mill. Type in B.M.

Auctorum.

Acontia guttistrigata, Wlk. xxxiii. 784 (1865). Type lost ... ... South Africa.

Genus HYELA.

Type.

Hyela, Steph. Cat. Lep. Brit. B.M. p. 149 (1850) *uncula*.

A. Forewing without white streak on median nervure .. .. .. *tristigmatias*.
B. Forewing with white streak on median nervure.
a. Forewing with the basal area dark .. .. *albifissa*.
b. Forewing with the basal area ochreous white .. .. .. *albibasis*.

(1) Hyela tristigmatias, n. sp.

Head, thorax, and abdomen brown mixed with fuscous. Forewing pale yellowish brown, the basal area irrorated with fuscous; the medial area wholly suffused with fuscous except inner area; a highly sinuous double antemedial black line; the orbicular rounded with pale brownish centre and black edges; the reniform rounded, slightly constricted at middle with pinkish centre and black outline, an indistinct line oblique from costa to its inner side, incurved below it and slightly angled outwards on vein 1; the postmedial line dentate, strongly bent outwards below costa, and incurved below vein 3; a dentate subterminal line with a dentate band of fuscous suffusion beyond it. Hindwing brown, suffused with fuscous with a discoidal spot and curved postmedial line more distinct on under side; cilia pale brown.

Hab. **British East Africa,** Kikuyu (Crawshay), Arthi River (Betton); **Mashonaland,** Salisbury (Marshall). *Exp.* 24 mill. Type in B.M.

(2) Hyela albifissa, n. sp.

♂. Head and thorax bright ferruginous and whitish; abdomen ochreous irrorated with fuscous. Forewing bright ferruginous; a whitish fascia from base of inner margin to origin of vein 2 then as a streak on median nervure and at end of cell forking on veins 4, 5 and ending at the postmedial line; the veins of costal area streaked with fuscous and grey scales; an ochreous fascia in and beyond cell; the inner area ochreous with a bright rufous streak below base of vein 2; two blackish discoidal points; the postmedial line white, bent outwards below costa to near termen and joined by a blackish streak from apex, then oblique, the area beyond it pink suffused with white and irrorated with black on each side of the indistinct whitish subterminal line; cilia ferruginous at base, whitish at tips. Hindwing pale yellowish, the costal and terminal areas slightly irrorated with brown; the under side with indistinct discoidal point and curved postmedial line.

Hab. **Natal,** Karkloof (Marshall). *Exp.* 26 mill. Type in B.M.

(3) Hyela albibasis, n. sp.

♀. Head and thorax ochreous white; palpi, antennæ, and base of patagia brownish; abdomen ochreous white irrorated with brown. Forewing with the basal third ochreous white bounded by a fine obliquely curved black line; the rest of wing pale olive-brown irrorated with black; an indistinct sinuous black medial line angled at lower angle of cell; a postmedial triangular white patch on costa extending down to vein 5 and embracing a small olive spot on costa; the postmedial line indistinct, slightly defined by white on outer side, excurved from costa to vein 4, then incurved, a whitish patch beyond it above tornus; an indistinct sinuous subterminal line with black spots on its inner side in discal and submedian folds; a terminal series of black points. Hindwing fuscous; the under side white irrorated with brown with slight discoidal spot and curved postmedial line and traces of subterminal line.

Hab. **Natal,** Durban (Leigh). *Exp.* 18 mill. Type in B.M.

Genus TATHORYNCHUS.

Type.

Tathorynchus, Hmpsn. Moths Ind. ii. p. 268 (1894) ... ... *vinctalis.*

A. Wings of male blackish; female with black point in lower angle of cell of forewing .. .. *plumbea.*
B. Wings in both sexes pale, suffused and irrorated with brown.
a. Forewing with round discoidal spot .. .. *homogyna.*
b. Forewing with black streak in end of cell .. .. *vinctalis.*

(1) Tathorynchus plumbea, Dist. A.M.N.H. (7) i. p. 221 (1898).
Hab. **British East Africa,** Machakos; **Transvaal; Basutoland,** Maseru (Crawshay); **Cape Colony,** Annshaw (Miss F. Barrett).
Exp. ♂ 30, ♀ 34 mill.

(2) Tathorynchus homogyna, n. sp.
Head, thorax, and abdomen pale brown mixed with dark brown and black scales; vertex of head and tegulæ black. Forewing pale suffused and irrorated with dark brown and striated with black leaving the disk paler; traces of a subbasal black point below the cell and one in middle of cell; a round discoidal spot; the terminal area darker. Hindwing pale tinged with fuscous, the terminal area and the veins in male deep fuscous.
Hab. **British East Africa,** Machakos; **Mashonaland,** Salisbury (Marshall); **Natal,** Victoria District (Gooch). *Exp.* ♂ 30, ♀ 36 mill. Type in B.M.

(3) Tathorynchus vinctalis, Wlk. xxxiv. 1476 (1865).
Hab. **Matabeleland,** Gwelo River (Oates); **Aden; India; Australia; U.S.A.** *Exp.* 34 mill.

Genus TOXOCAMPA.

	Type.
Toxocampa, Guen. Ann. Soc. Ent. Fr. 1841, p. 76	*cracca.*

Toxocampa salax, Guen. Noct. ii. p. 428 (1852).
Hab. **Natal,** Estcourt (Hutchinson); **Cape Colony.** *Exp.* 36 mill.

Genus RAPARNA.

	Type.
Raparna, Moore, Lep. Atk. p. 177 (1882)	*ochreipennis.*

A. Forewing with the terminal area darker than the ground colour.
a. Forewing clear ochreous with slight dark markings .. .. *africana.*
b. Forewing clouded with brown or greenish and strongly mottled .. .. *fragilis.*

B. Forewing with the terminal area not darker than the ground colour.
  a. Forewing with the postmedial line very oblique, almost meeting the subterminal line at costa .. .. *halesusalis.*
  b. Forewing with the postmedial and subterminal lines more parallel and well separated at costa.
    a^1. Forewing with the postmedial line not angled inwards to costa .. .. *heliriusalis.*
    b^1. Forewing with the postmedial line angled inwards to costa .. .. *tritonias.*

(1) Raparna africana, Snell, Tijd. v. Ent. xv. p. 56, pl. 5, f. 1 (1872).
Hab. **West Africa,** Nigeria, Lower Guinea; **British East Africa,** Machakos, Kikuyu, Eb. Urru; **Mashonaland,** Salisbury (Marshall); **Natal,** Durban (Leigh). *Exp.* 20–26 mill.

(2) Raparna fragilis, Butl. A.M.N.H. (4) xvi. p. 413 (1875).
Hab. **West Africa,** Nigeria; **British East Africa,** Nairobi, Eb. Urru; **N'Gamiland** (Lugard); **Natal** (Burrows). *Exp.* 24–26 mill.

(3) Raparna helesusalis, Wlk. xvi. 238 (1858).
Xanthoptera murœnula, Wllgrn. Œfv. Vet. Akad. Förh. 1875, p. 113.
Hab. **Transvaal; Cape Colony** (Dr. Smith), Transkei (Miss F. Barrett). *Exp.* 30 mill.

(4) Raparna heliriusalis, Wlk. xvi. 112 (1858).
Hab. **Cape Colony** (Dr. Smith). *Exp.* 30 mill.

(5) Raparna tritonias, n. sp.

Head and thorax reddish orange with darker irroration; palpi dark at sides; tegulæ dark at tips; abdomen ochreous tinged with red and with dark irroration especially on dorsum. Forewing orange thickly blotched with red and with some dark irroration; an indistinct subbasal line from costa to below cell, angled below costa; the antemedial line waved; orbicular and reniform large outlined with brown, the former open below, the latter with black points at angles of cell; the postmedial line obtusely angled outwards below costa and at vein 4 where there is a dark spot and inwards in discal and submedian folds; a subterminal maculate line angled outwards at veins 7 and 4; a terminal series of black points. Hindwing pale yellowish suffused with red on inner and terminal areas; indistinct waved medial and postmedial lines obsolete towards costa; a terminal series of black points. Under side of both wings with sinuous

postmedial line ; forewing with black spot below costa towards apex ; hindwing with black discoidal spot.

Hab. **British East Africa,** Kikuyu (Crawshay) ; **Natal,** Durban (Barker). *Exp.* 36 mill.

Genus XANTHOPTERA.

Type.

Xanthoptera, Guen. Noct. ii. p. 240 (1852) ... *botyoides.*

A. Forewing with the terminal area darker than the ground colour.
  a. Forewing yellow with the terminal area pink .. .. *sacraria.*
  b. Forewing ochreous with the terminal area purplish grey .. *griseocincta.*
  c. Forewing whitish with the terminal area blackish .. .. *porphyrea.*
B. Forewing with the terminal area not darker than the ground colour.
  a. Hindwing with the ground colour not orange.
    a^1. Forewing olive-green with white ante- and post-medial bands .. .. *olivula.*
    b^1. Forewing blackish with more or less developed white ante- and post-medial bands .. .. *excisa.*
    c^1. Forewing blackish with leaden-grey bands .. .. *namacensis.*
    d^1. Forewing blackish with leaden-grey dentate lines .. .. *carcaroda.*
    e^1. Forewing without white or leaden bands.
      a^2. Forewing with white streak above median nervure and vein 5 .. .. *abunda.*
      b^2. Forewing without white streak above median nervure and vein 5.
        a^3. Forewing with the ground colour greyish white .. *grandirena.*
        b^3. Forewing with the ground colour yellowish.
          a^4. Forewing with distinct black spot at lower angle of cell.
            a^5. Forewing with black spot in middle of cell *tripuncta.*
            b^5. Forewing without black spot in middle of cell .. .. *unipuncta.*
          b^4. Forewing without distinct black spot at lower angle of cell .. .. *frausa.*
  b. Hindwing with the ground colour orange.
    a^1. Forewing with the line bounding the brown area highly angled at lower angle of cell and with dark suffusion before it .. .. *genuflexa.*
    b^1. Forewing with the line bounding the brown area slightly angled at lower angle of cell and without dark suffusion before it .. .. *albifascia.*

(1) Xanthoptera sacraria, Feld. Reis. Nov. pl. 108, f. 17 (1874).
Hab. **Natal,** Karkloof (Marshall), Estcourt (Hutchinson) ; **Cape Colony,** Transkei, Annshaw (Miss F. Barrett). *Exp.* 30 mill.

(2) Xanthoptera griseocincta, n. sp.

♀. Ochreous tinged with rufous ; tegulæ and thorax with dorsal grey and fuscous stripe. Forewing with indistinct sinuous almost

medial line, very strongly excurved below vein 2 and ending in a tuft of rufous and black scales on inner margin; the orbicular and reniform small, indistinct with pale outlines, the latter strongly constricted at middle; the postmedial line dark, minutely waved, very strongly excurved below costa, then obliquely curved to middle of inner margin, with two pale waved lines on its inner side; the terminal area purplish grey irrorated with fuscous; an indistinct minutely waved curved fuscous subterminal line and a fine crenulate black terminal line. Hindwing ochreous suffused with brown, especially on terminal half, and with darker terminal band with traces of a curved pale line on it.

Hab. **N'Gamiland** (Lugard). *Exp.* 26 mill. Type in B.M.

(3) Xanthoptera porphyrea, Butl. P.Z.S. 1898, p. 420.

Hab. **West Africa,** Accra: **British East Africa,** Neugia, Voi; **N'Gamiland** (Lugard). *Exp.* 20–24 mill.

The types of this species are both females, the so-called male belonging to this species, the female to *Megalodes insocia*, Wlk.

(4) Xanthoptera olivula, Guen. Noct. ii. p. 231 (1852).

Hab. **Natal** coast belt (Barker); **Cape Colony.** *Exp.* 26 mill.

(5) Xanthoptera excisa, Swinh. P.Z.S. 1885, p. 455.

Tarache æthiops, Dist. A.M.N.H. (7) i. p. 223 (1898).

Hab. **Gambia,** Bathurst; **British East Africa,** Machakos, Kilimakiu; **Mashonaland,** Salisbury (Marshall); **Transvaal,** Pretoria (Distant); **India.** *Exp.* 18–22 mill.

(6) Xanthoptera namacensis, Guen. Noct. ii. p. 258 (1852).

Hab. **Abyssinia; Angola,** Ambriz; **Namaqualand; Natal,** Malvern (Marshall), Durban (Bowker); **Cape Colony,** Annshaw (Miss F. Barrett). *Exp.* 24 mill.

(7)*Xanthoptera carcaroda, Dist. Entom. 1901, p. 284.

Hab. **Transvaal.** *Exp.* 34 mill.

(8)*Xanthoptera abunda, Feld. Reis Nov. pl. 108, f. 46 (1874).

Hab. **Cape Colony.** *Exp.* 28 mill.

(9) Xanthoptera grandirena, n. sp.

♂. Ochreous whitish; fore- and mid-legs tinged with fuscous above; abdomen dorsally tinged with fuscous. Forewing with a

greyish tinge; a large triangular blackish patch on costa from near base to middle, its apex on submedian fold and enclosing the large pale oblique orbicular stigma; reniform very large, pale, indistinct; the postmedial line very indistinct, bent outwards below costa, then oblique and dentate, a brown band beyond it, bent outwards to termen below apex, its outer edge excurved below middle and at inner margin; some brownish suffusion on termen above tornus; a terminal series of black points; the cilia chequered pale and black. Hindwing suffused with fuscous except towards base.

Hab. **Natal,** Victoria District (Gooch), Durban (Leigh). *Exp.* 36 mill. Type in B.M.

(10) Xanthoptera tripuncta, n. sp.

♀. Head and thorax orange-yellow; pectus, fore- and mid-legs, and abdomen fuscous, the last yellowish at base. Forewing pale yellow, more orange towards margins; a black point in base of cell, and spots in middle of cell and at lower angle. Hindwing fuscous, the cilia yellowish. Under side of forewing fuscous, the margins yellow.

Hab. **Mashonaland,** Salisbury (Marshall). *Exp.* 20 mill. Type in B.M.

(11) Xanthoptera unipuncta, n. sp.

♀. Palpi long, orange with the third joint black; head black, the lower part of frons and vertex orange; thorax and abdomen fuscous; tegulæ in front, hind legs towards extremity, and extremity of abdomen yellow; wings ochreous suffused with fuscous grey. Forewing with the costa and cilia yellow; a black discoidal spot and slight subterminal points above veins 6 and 3. Hindwing with the cilia yellowish.

Hab. **Mashonaland,** Salisbury (Marshall). *Exp.* 20 mill. Type in B.M.

(12) Xanthoptera frausa, Swinh. P.Z.S. 1886, p. 446.

Hab. **Mashonaland,** Salisbury (Marshall); **Natal,** Victoria District (Gooch); **India**; **Ceylon.** *Exp.* 18 mill.

(13) Xanthoptera genuflexa, n. sp.

Head and thorax reddish or grey-brown; abdomen yellowish, dorsally suffused with brown. Forewing with the basal half grey or reddish brown with an indistinct waved antemedial line; the brown area bounded by a grey line very oblique from costa to lower angle of cell where it is strongly angled and with a prominent blackish

shade before it; the terminal half pale olive-brown with some black scales on discocellulars and a darker shade before the grey subterminal line which is excurved at middle; the termen with brown patch above middle and at tornus and with terminal series of black points; cilia dark brown. Hindwing orange, the basal and costal areas tinged with brown; some slight brown streaks on the veins at termen; cilia brownish.

Hab. **Damaraland; Cape Colony,** Annshaw (Miss F. Barrett). *Exp.* 24 mill. Type in B.M.

(14) Xanthoptera albifascia, Wlk. xxxiii. 771 (1865).
Hab. **Cape Colony** (Dr. Smith). *Exp.* 22 mill.

Genus COSMOPHILA.

	Type.
Cosmophila, Boisd. Faun. Ent. Mad. p. 94 (1833)	*erosa.*
Lineopalpa, Guen. Noct. ii. p. 290 (1852) ...	*horsfieldi.*

A. Forewing with the postmedial line angled outwards in submedian interspace.
  a. Forewing with the subterminal line dentate.
    a^1. Forewing with the termen slightly angled at vein 4 .. *erosa.*
    b^1. Forewing with the termen curved .. .. *luperca.*
  b. Forewing with the subterminal line not dentate .. .. .. *subroseatis.*
B. Forewing with the postmedial line slightly sinuous in submedian interspace .. .. *fulvida.*
C. Forewing with the postmedial line incurved in submedian interspace .. .. *sabulifera.*

(1) Cosmophila erosa, Hübn. Zutr. Samml. Exot. Schmett. ii. 19, ff. 287–288 (1827).
Cosmophila indica, Guen. Noct. ii. p. 396 (1852).
,, *auragoides*, Guen. Noct. ii. p. 397 (1852).
Hab. **U.S.A.; West Indies; South America; West Africa; Sokotra; British East Africa; Mashonaland,** Salisbury (Marshall); **N'Gamiland** (Lugard); **Natal** (Gooch, Burrows), Durban (Leigh); **Madagascar; Mauritius; Japan; China; India, Ceylon,** and **Burma; Australia.** *Exp.* 38 mill.

(2) Cosmophila luperca, Möschl. Verh. Zool. bot. Ges. Wien. xxxiii. p. 300, pl. xvi. f. 15 (1883).
Hab. **Gazaland,** Chirinda Forest (Marshall); **Cape Colony,** Transkei (Miss F. Barrett). *Exp.* 42 mill.

(3) Cosmophila subrosealis, Wlk. xxxiv. 1158 (1865).
Hab. **Natal** (Gueinzius). *Exp.* 32 mill.

(4) Cosmophila fulvida, Guen. Noct. ii. p. 397 (1852).
Hab. **Natal**, Durban (Leigh); **Japan**; **China**; **India, Ceylon**, and **Burma**; **Java**; **Australia**; **Pacific groups.** *Exp.* 54 mill.

(5) Cosmophila sabulifera, Guen. Noct. ii. p. 404 (1852).
Hab. **West Africa**; **Abyssinia**; **British East Africa**; **Mashonaland**, Salisbury (Marshall); **Natal**, Estcourt (Hutchinson); **Cape Colony**, Grahamstown; **Aden**; **India, Ceylon**, and **Burma**. *Exp.* 32–38 mill.

Auctorum.

Gonitis pusilla, Butl. A.M.N.H. (4) xvi. p. 405 (1875). Type lost ... ... Natal.

Genus CALLYNA.

	Type.
Callyna, Guen. Noct. i. p. 112	*siderea.*

A. Forewing black.
  a. Forewing with flesh-coloured apical patch .. .. *decora.*
  b. Forewing without flesh-coloured apical patch .. .. .. *nigerrima.*
B. Forewing cupreous red suffused with purple.
  a. Forewing with white apical spot .. .. *figurans.*
  b. Forewing without white apical spot.. .. .. *cupricolor.*

(1) Callyna decora, Wlk. xiii. 1119 (1857).
Hab. **Natal** (Burrows, Gooch), Durban (Leigh). *Exp.* 50 mill.

(2) Callyna nigerrima, n. sp.
Deep black; tibiæ and tarsal joints with small orange spots. Forewing with small dull orange spot on middle of costa and three or four points towards apex. Hindwing silky fuscous. Under side of both wings with indistinct medial line, on hindwing angled at vein 3.
Hab. **British Central Africa**, Stevenson Road (Dewar); **Mashonaland**, Salisbury (Marshall). *Exp.* 40–44 mill. Type in B.M.

(3) Callyna figurans, Wlk. xv. 1667 (1858).
Hab. **Natal**, Durban (Gueinzius, Leigh). *Exp.* 40 mill.

(4) Callyna cupricolor, n. sp.

♂. Head and thorax fuscous black; pectus white mixed with grey; legs blackish with pale rings on the tarsal joints; abdomen white suffused with blackish. Forewing cupreous red suffused with purple except on inner margin and terminal area, the costal area blackish; a very elongate claviform stigma with blackish outline; the orbicular and reniform indistinct with greyish annuli defined by black, the latter with some short dark streaks in the interspaces beyond it. Hindwing white, the veins, costal and terminal areas tinged with fuscous; the under side with discoidal point.

Hab. **Mashonaland,** Salisbury (Marshall). *Exp.* 34 mill. Type in B.M.

Genus BANIANA.

	Type.
Baniana, Wlk. xv. 1843 (1858)	*significans.*
Tephrias, Wllgrn. Wien. Ent. Mon. iv. p. 170 (1860)	*plumipes.*
Baxagha, Wlk. xxxiii. 1002 (1865)	*plumipes.*

Sect. I. Antennæ of male bipectinate.

A. (*Tephrias*) Mid tibiæ of male and first joint of tarsi fringed with long hair on inner side; hind tibiæ tufted with long hair.

(1) Baniana plumipes, Wllgrn. Wien. Ent. Mon. iv. p. 170 (1860).
Baxagha serpentina, Wlk. xxxiii. 1002 (1865).
Hab. **Natal,** Victoria District (Gooch); **Cape Colony,** Caffraria. *Exp.* 36 mill.

B. Mid tibiæ of male, but not the tarsal joints, fringed with very long hair (hind legs wanting).

(2) Baniana hamifera, n. sp.

♂. Head and thorax brown mixed with grey, the scales tipped with grey; the fringe of hair on mid tibiæ black and brown; abdomen grey-brown. Forewing grey thickly irrorated with brown; an antemedial white-edged black band from cell to inner margin with its outer edge hooked; a small white-edged black spot in cell; the terminal area suffused with black most deeply towards the white line on its inner edge which is slightly sinuous from costa to vein 4, then retracted to upper angle of cell, then nearly erect; a terminal lunulate line. Hindwing fuscous brown.

♀. Rather darker.

Hab. **British Central Africa,** Chiromo (de Jersey); **Mashonaland,** Salisbury, Umtali (Marshall). *Exp.* 26–30 mill. Type in B.M.

C. Legs not tufted with hair.
  a. Forewing with conical black patch on inner margin extending into cell .. .. *disjuncta.*
  b. Forewing without conical black patch on inner margin .. *poderis.*

(3) Baniana disjuncta, Wlk. xxxiii. 999 (1865).
Hab. **Natal** (Gueinzius). *Exp.* 30 mill.

(4) Baniana poderis, Wllgrn. Wien. Ent. Mon. vii. p. 149 (1863).
Hab. **British East Africa; Mashonaland,** Salisbury (Marshall); **Natal,** Karkloof (Marshall), Victoria District (Gooch), Durban (Leigh). *Exp.* 30–34 mill.

Sect. II. Antennæ of male ciliated.

A. Forewing with hamate antemedial black patch.
  a. Head and tegulæ ferruginous .. .. *atripuncta.*
  b. Vertex of head and tegulæ black .. .. *unipuncta.*
B. Forewing without hamate antemedial black patch.
  a. Forewing with the postmedial line retracted from vein 3 to below end of cell .. .. *arvorum.*
  b. Forewing with the postmedial line not retracted to below end of cell.
    a^1. Forewing without pale oblique ante- and post-medial lines.
      a^2. Head and edges of tegulæ yellow .. .. *flaviceps.*
      b^2. Head and edges of tegulæ not yellow .. .. *pallidicosta.*
    b^1. Forewing with pale oblique ante- and post-medial lines *parallella.*

(5) Baniana atripuncta, n. sp.

Head and tegulæ fulvous yellow; palpi brown, pale at extremity; thorax and abdomen pale ochreous tinged with brown. Forewing ochreous white irrorated with brown, more thickly on costal area; a black point at base of cell; an antemedial white-edged black patch extending just into the cell and with hamate outer edge; a black spot at upper angle of cell; the terminal area black, grey towards termen and with a whitish line on its inner edge, erect from costa to vein 4, then retracted to middle of discocellulars, then straight to inner margin; a terminal series of black points. Hindwing fuscous brown.

Hab. **West Africa,** Accra (Sir G. Carter); **Natal,** Victoria District (Gooch). *Exp.* 28 mill. Type in B.M.

(6) Baniana unipuncta, n. sp.

♂. Head and thorax brownish grey; vertex of head and tegulæ

black; abdomen pale brown. Forewing grey-brown, with white-edged antemedial black patch on inner margin extending into the cell and with strongly hamate outer edge; a white-edged black point in middle of cell; the terminal area suffused with black becoming greyish towards termen and with whitish line on its inner edge which is obliquely curved from costa to vein 5, then retracted to upper angle of cell, then obliquely curved to outer margin; an indistinct postmedial line bent outwards below costa, excurved to vein 5 where it crosses the sinus of dark area, then incurved; a terminal series of black points. Hindwing fuscous brown with fine dark terminal line; cilia whitish; the under side whitish irrorated with brown.

♀. Darker; the thorax and forewing suffused with purple.

Hab. **British Central Africa,** Likoma (de Jersey); **Natal,** Victoria District (Gooch), Durban (Leigh). *Exp.* 26–30 mill. Type in B.M.

(7) Boniana arvorum, Guen. Noct. ii. p. 258 (1852).
,, *recussa*, Dist. A.M.N.H. (7) i. p. 230 (1898).

Hab. **Transvaal,** Pretoria (Distant); **Natal,** Victoria District (Gooch); **Cape Colony,** Transkei (Miss F. Barrett). *Exp.* 30 mill.

(8) Baniana flaviceps, n. sp.

♀. Head and palpi rufous, the vertex yellow; antennæ blackish; tegulæ fuscous pencilled with grey and edged with yellow; thorax purplish fuscous pencilled with grey; abdomen blackish irrorated with grey. Forewing purplish fuscous irrorated with a few black scales; an indistinct waved dark antemedial line with some grey scales on it; a small black discoidal spot with some grey scales on it; a sinuous postmedial dark line with some grey scales on it, strongly bent outwards below costa, erect to vein 4, then incurved; an indistinct dentate subterminal line; a terminal series of black points. Hindwing fuscous brown; the under side ochreous thickly irrorated with dark brown; a dark discoidal point and diffused medial line.

Hab. **Mashonaland,** Salisbury (Marshall). *Exp.* 32 mill. Type in B.M.

(9) Baniana pallidicosta, n. sp.

♀. Head and thorax black mixed with ochreous; abdomen ochreous brown irrorated with black especially on ventral surface. Forewing ochreous brown suffused with black except on costal area

where it is irrorated with black; traces of an antemedial series of pale points; orbicular small round, ochreous with fuscous centre, and with a black streak between it and the reniform which is ochreous, defined by black and with some fuscous in centre; base of vein 5 streaked with black; traces of a curved postmedial series of pale points; the veins streaked with black towards termen. Hindwing ochreous wholly suffused with fuscous; the cilia ochreous with a fuscous line through them. Under side ochreous white irrorated with fuscous, the disk of forewing suffused with fuscous.

Hab. **Mashonaland,** Salisbury (Marshall). *Exp.* 40 mill. Type in B.M.

(10) Baniana parallella, n. sp.

♂. Ochreous irrorated with pale rufous brown; palpi darker brown at sides. Forewing with clear ochreous antemedial line acutely angled outwards below costa then straight and oblique; black points at the angles of cell; the postmedial line very strongly bent outwards below costa, and acutely angled below apex, then very oblique and almost straight; a sinuous subterminal line; some ochreous points on apical part of costa and a small black streak at apex; a fine ochreous line at base of cilia. Hindwing with the cilia ochreous.

Hab. **Cape Colony,** Transkei (Miss F. Barrett). *Exp.* 22 mill. Type in B.M.

Genus BREVIPECTEN.

	Type.
Brevipecten, Hmpsn. Moths, Ind. ii. p. 361 ...	*captatus.*

Brevipecten cornuta, n. sp.

♀. Head and thorax grey irrorated with brown; palpi blackish at sides; legs marked with brown; abdomen ochreous slightly irrorated with brown. Forewing grey-white irrorated with brown; the basal half of costal area suffused with brown; a fine brown antemedial obliquely incurved line ending at middle of inner margin; an obliquely incurved line from origin of vein 2 to inner margin at postmedial line; an obliquely curved chocolate mark from costa to just below lower angle of cell with a sinuous white discoidal line on its outer edge; an oblique line beyond the cell between veins 7 and 3; the postmedial line oblique from costa to vein 4 where it is obliquely angled, then inwardly oblique and slightly sinuous to inner margin; a triangular chocolate patch on costa before apex to above vein 6 with a slight curved mark below its extremity; a

crenulate line just before termen. Hindwing yellowish tinged with brown; pale towards base; cilia whitish with a brown line at base.

The N'Gamiland specimen is small, has the lines of forewing much less distinct, and the patch on costa before apex more truncate: it may be a distinct species.

Hab. **N'Gamiland** (Lugard); **Delagoa Bay** (Mrs. Monteiro). *Exp.* 26–38 mill.

Genus CORGATHA.

	Type.
Corgatha, Wlk. xvi. 215 (1858)...	*zonalis*.
Phanaspa, Wlk. xxxiv. 1211 (1865)... ...	*thermesialis*.

Sect. I. (*Phanaspa*). Fore femora and tibiæ of male thickly tufted with hair; patagia with tufts of scales reaching beyond metathorax; the base of inner area of both wings with tufts of rough hair.

(1) Corgatha thermesialis, Wlk. xxxiv. 1211 (1865).

Hab. **West Africa,** Sierra Leone; **British East Africa,** Nairobi, Machakos, Eb. Urru; **Mashonaland,** Salisbury (Marshall); **Natal,** Malvern (Gueinzius, Marshall); **Cape Colony,** Transkei (Miss F. Barrett). *Exp.* 24–26 mill.

Sect. II. (*Corgatha*). Legs, patagia, and wings of male normal.

(2) Corgatha producta, n. sp.

♂. Rather pale rufous; palpi and frons deep rufous; a white bar between antennæ; abdomen slightly irrorated with black on dorsum. Forewing with oblique antemedial series of five black points; a medial line strongly angled outwards below costa and black from costa to angle, then brown and oblique; a postmedial series of black points incurved to costa, then oblique, the point on vein 2 displaced inwards; an indistinct, pale, subterminal line slightly defined on each side by fuscous, oblique from costa to vein 5, then excurved at medial nervules; the apex whitish; a terminal series of black points with larger spot above tornus. Hindwing with oblique brown antemedial line; an indistinct postmedial series of white and black points excurved at median nervules; some slight subterminal and terminal black points; cilia of both wings brown, whitish at tips.

Hab. **Natal,** Durban (Leigh). *Exp.* 18 mill. Type in B.M.

Genus PARORUZA, nov.

Palpi slender, upturned, not reaching vertex of head; antennæ of male with short branches ending in a bristle. Forewing with the apex produced and acute; vein 3 from before angle of cell; 5 from above angle; 6 from upper angle; 9, 10 anastomosing with 8 to form the areole, 11 curved downwards and nearly touching them. Hindwing with veins 3, 4 from angle of cell; 5 from well above angle; 6, 7 from upper angle.

Paroruza subductata, Wlk. xxxiii. 790 (1861).

Hab. **Natal,** Durban (Leigh); **Cape Colony.** *Exp.* 32 mill.

Genus EUBLEMMISTIS, nov.

Proboscis rather slight; palpi obliquely porrect, reaching well beyond frons, which is rounded; antennæ of female with slight tufts of scales at the joints; tibiæ with the spurs long; abdomen with slight dorsal crests towards base. Forewing with the apex produced and acute, the termen strongly excurved at middle; veins 3 and 5 from near angle of cell; 6 from below upper angle; 7, 8, 9, 10 stalked; 11 from cell. Hindwing with veins 3, 5 from angle of cell; 5 from well above angle, rather slender; 6, 7 from upper angle.

Eublemmistis chlorozonea, n. sp.

♀. Dull white; palpi, frons, and legs tinged with brown; thorax irrorated with a few olive scales; abdomen irrorated with brown. Forewing irrorated with olive-green and a few black scales; a waved olive-green antemedial line; two black discoidal points; a dentate postmedial line strongly excurved beyond cell, then incurved, narrowly defined with white on outer side, then with broad olive-green band with dentate outer edge strongly angled inwards in discal fold, angled outwards at vein 4, then incurved; a terminal series of black points; cilia olive-green. Hindwing irrorated with olive-green and a few black scales; two black discoidal points; a minutely dentate olive-green medial line defined narrowly by white on outer side followed by an olive-green band with dentate outer edge; traces of a subterminal line; a terminal series of black points; cilia olive-green.

Hab. **Natal,** Durban (Leigh). *Exp.* 26 mill. Type in B.M.

Genus NEOCHROSTIS, nov.

Palpi upturned, the second joint thickly scaled, the third moderate; frons with beak-shaped corneous process, the sides of frons pro-

duced below it; antennæ of male almost simple; tibiæ with the spurs moderate; abdomen smoothly scaled. Forewing with vein 3 from before angle of cell; 5 from above angle; 6 from below upper angle; 7 from angle; 8, 9, 10 stalked; 11 from cell. Hindwing with veins 3, 4 from angle of cell; 5 from below middle of discocellulars; 6, 7 from upper angle.

NEOCHROSTIS DIPLOGRAMMA, n. sp.

♂. Head and thorax red-brown mixed with fuscous; palpi pale ochreous below; pectus and legs ochreous and orange, the legs with some brown; abdomen orange dorsally suffused with brown. Forewing red-brown suffused with fuscous; a double-curved black antemedial line; the reniform pale rufous with brown centre and black outline emitting a spur towards base on median nervure, and situated on a diffused medial black line angled at lower angle of cell; a double sinuous black postmedial line strongly angled outwards below costa and inwards below vein 2, traces of a line beyond it angled outwards at veins 6 and 4; a pale minutely waved subterminal line; a fine black terminal line. Hindwing orange with slight diffused streaks of black scales and discal point; a diffused curved fuscous subterminal line; a fine black terminal line; cilia fuscous. Under side of forewing with the basal half, a curved postmedial line and subterminal series of spots orange.

Hab. **Transvaal** (Ross). *Exp.* 32 mill. Type in B.M.

GENUS METACHROSTIS.

	Type.
Metachrostis, Hübn. Verz. p. 204 (1818) ...	*velox.*
Zalaca, Wlk. xxxiv. 1202 (1865)	*anticalis.*

A. Hindwing orange or with orange markings.
  a. Forewing with nearly straight pale brownish postmedial band .. .. *orthozona.*
  b. Forewing without nearly straight pale postmedial band.
    a^1. Forewing with pale postmedial area .. .. *madanda.*
    b^1. Forewing without pale postmedial area.
      a^2. Forewing with nearly straight medial line, the area beyond it darker.
        a^3. Forewing with the postmedial line angled below costa then incurved .. .. *accincta.*
        b^3. Forewing with the postmedial line excurved from costa to vein 4, then erect .. .. .. *cryptochrysea.*
        c^3. Forewing with the postmedial line sinuous.. *contempta.*
      b^2. Forewing with the medial line waved, the area beyond it not darker.

a^3. Forewing with the postmedial line not bent inwards to costa .. .. *cinerea.*

b^3. Forewing with the postmedial line strongly bent inwards to costa.

a^4. Hindwing orange or with orange subterminal band.

a^5. Forewing with the postmedial line not dentate on vein 1 .. .. *heliastis.*

b^5. Forewing with the postmedial line dentate outwards on vein 1 .. .. *varia.*

b^4. Hindwing black with small orange spots near tornus .. .. *hypoxantha.*

B. Hindwing pale yellow .. .. *flavinia.*

C. Hindwing brown with whitish bands.

a. Forewing with the postmedial line excurved below costa, then incurved .. .. *hypotœnia.*

b. Forewing with the postmedial line sinuous throughout .. *bolinia.*

D. Hindwing uniform brown or fuscous

a. Forewing green and blackish .. .. *nigroviridis.*

b. Forewing without green.

a^1. Forewing with oblique postmedial whitish and brown band .. .. *abscissa.*

b^1. Forewing without oblique pale postmedial band.

a^2. Forewing with the basal half blackish, the terminal half paler.

a^3. Forewing with the edge of blackish area irregularly waved .. .. *decissima.*

b^3. Forewing with the edge of blackish area oblique to median nervure where it is angled.

a^4. Forewing with the edge of blackish area angled at lower angle of cell .. .. .. *semipurpurea.*

b^4. Forewing with the edge of blackish area angled before lower angle of cell .. .. *consanguis.*

b^2. Forewing with the basal half not blackish.

a^3. Forewing with the basal half pale, the terminal half dark grey .. .. *bipartita.*

b^3. Forewing brown.

a^4. Forewing with the postmedial line angled below costa, then nearly straight.

a^5. Forewing with the antemedial line straight.. .. .. *punctigera.*

b^5. Forewing with the antemedial line waved .. .. *corniculans.*

b^4. Forewing with the postmedial line excurved at middle.

a^5. Forewing with blackish patch on costa before apex .. .. *fusca.*

b^5. Forewing without blackish patch on costa before apex.

a^6. Forewing with the postmedial line angled outwards below costa .. .. *inobtrusa.*

b^6. Forewing with the postmedial line oblique from costa to vein 6 .. .. *phœa.*

c^3. Forewing with ground colour grey.

a^4. Forewing narrow, the lines whitish .. .. *negrita.*

b^4. Forewing broad, the lines black .. .. .. *tritonia.*

. Hindwing greyish with dark lines and suffusion.
a. Forewing greyish without apical blackish patch.. .. .. *snelleni.*
b. Forewing whitish with blackish apical patch.
*a*¹. Forewing with ante- and post-medial triangular black spots on costa .. .. *anticalis.*
*b*¹. Forewing without distinct black spots on costa .. .. *rubripuncta.*

(1) METACHROSTIS ORTHOZONA, n. sp.

♂. Head and thorax fuscous brown; pectus and legs orange irrorated with fuscous and the forelegs streaked with fuscous; abdomen orange dorsally irrorated with fuscous. Forewing dark greyish brown with nearly straight pale brownish postmedial band with indistinct line on it; a brownish spot on costa before apex with traces of two irregular lines arising from it, the inner angled inwards on discal and submedian folds; a terminal series of blackish points. Hindwing orange; some brown suffusion at base; a terminal brown band expanding widely on costa and not reaching tornus. Under side of forewing with the band and a costal fascia from base to near apex orange.

Hab. **Cape Colony,** Annshaw (Miss F. Barrett). *Exp.* 24 mill. Type in B.M.

(2) MATACHROSTIS MADANDA Feld. Reis. Nov. pl. 108, f. 28 (1874).
Acontia dignata, Möschl. z. b. Wien. xxxiii. p. 297, pl. xvi. f. 12 (1883).
Hab. **Cape Colony,** Uitenhage (Bairstow, Dr. Smith). *Exp.* 24 mill.

(3)*METACHROSTIS ACCINCTA, Dist. A.M.N.H. (7) i. p. 224 (1898).
Hab. **Transvaal,** Pretoria (Distant). *Exp.* 22 mill.

(4)*METACHROSTIS CRYPTOCHRYSEA, n. sp.

♀. Head, thorax, and abdomen pale reddish brown slightly mixed with fuscous; pectus and ventral surface of abdomen whitish; tarsi black ringed with white. Forewing with the basal area pale reddish brown with some black costal points and traces of a subbasal line; the antemedial line black, nearly straight, shading off to red-brown towards the postmedial line; an indistinct waved medial line with black striga on it below costa, then excurved; reniform elliptical defined by black; the postmedial line double, obliquely curved from costa to vein 4, then erect and with a black lunule beyond it between veins 4 and 7; an indistinct sinuous subterminal line with black mark beyond it below apex; a black terminal line except towards tornus; a white spot on cilia at apex.

Hindwing bright orange, with black streak below base of cell and black apical spot followed by short streaks to vein 2; cilia black, white at tips at apex and middle.

Hab. **Delagoa Bay** (Mrs. Monteiro). *Exp.* 22 mill. Type in Coll. Druce.

(5)*Metachrostis contempta, Wlk. xv. 1762 (1858).

Hab. **Cape Colony,** Annshaw (Miss F. Barrett, Dr. Smith). *Exp.* 24 mill.

(6)*Metachrostis cinerea, Auriv. Œfv. af. k. Vetensk. Akad. Förh. 1879, p. 68.

Hab. **Damaraland** (De Vylder). *Exp.* 26 mill.

(7) Metachrostis heliastis, n. sp.

Head and thorax grey-brown mixed with dark brown; palpi below, pectus and legs whitish, the last marked with black and brown; abdomen orange suffused with brown, the ventral surface whitish. Forewing grey-brown suffused with purplish brown on terminal half; a fine straight antemedial line on a grey band; the reniform greyish 8-shaped; the postmedial line oblique from costa to beyond the reniform, incurved below it and slightly excurved towards inner margin; an indistinct irregularly sinuous pale subterminal line; cilia blackish, pale below apex. Hindwing orange; a diffused black costal fascia extending into the cell; black streaks in submedian fold and on inner margin not reaching termen; an apical black patch and fine terminal line; cilia blackish. Under side of forewing orange with black discoidal point and apical patch.

Hab. **British East Africa,** Machakos (Crawshay), Teita (Jackson); **Cape Colony,** Transkei (Miss F. Barrett). *Exp.* 18–22 mill. Type in B.M.

(8) Metachrostis varia, Wlk. xxxiii. 772 (1865).

Panemeria densa, Wlk. xxxiii. 773 (1865).

Acontia acclivis, Feld. Reis. Nov. pl. 108, f. 24 (1874).

Microphysa perssoni, Wllgrn. Œfv. af. k. Vet. Akad. Förh. 1875 p. 114.

Microphysa mustelina, Wllgrn. Œfv. af. k. Vet. Akad. Förh. 1875, p. 115.

Hab. **Aden; British East Africa,** Machakos; **Mashonaland,** Salisbury (Marshall); **N'Gamiland** (Lugard); **Transvaal** (Ross); **Bechuanaland** (Alston); **Natal,** Estcourt (Hutchinson), Durban

(Bowker, Gooch); **Basutoland,** Maseru (Crawshay); **Cape Colony,** Annshaw (Miss F. Barrett, Dr. Smith). *Exp.* 20–30 mill.

(9) METACHROSTIS HYPOXANTHA, Wllgrn. Wien. Ent. Mon. 1860, p. 173.

Metachrostis vultuosa, Dist. A.M.N.H. (7) i. p. 224 (1898).

Hab. **Transvaal; Natal,** Estcourt (Hutchinson), Verulam (Gooch); **Cape Colony,** Annshaw (Miss F. Barrett). *Exp.* ♂ 18, ♀ 24 mill.

(10)*METACHROSTIS FLAVINIA, n. sp.

♂. Head, thorax, and abdomen orange-yellow. Forewing yellowish suffused with grey and with numerous ill-defined waved rufous lines; a diffused brown discoidal patch; the postmedial line more distinct, minutely waved, bent outwards below costa, angled inwards in discal fold and incurved below vein 4; a terminal series of rufous points; cilia yellow. Hindwing yellow with slight brown postmedial marks on vein 2 and inner margin.

Hab. **Transvaal,** Potchefstroom (Ayres). *Exp.* 26 mill. **Type** in Coll. Druce.

(11) METACHROSTIS HYPOTÆNIA, Wllgrn. Wien. Ent. Mon. 1860, p. 173.

Hab. **British East Africa,** Naitolia, Machakos, Eb. Urru; **Natal,** Mooi River, Victoria District (Gooch). *Exp.* 18–22 mill.

(12) METACHROSTIS BOLINIA, n. sp.

♂. Grey-brown; forelegs banded with fuscous; abdomen with dorsal fuscous bands. Forewing with the basal half tinged with rufous and bounded by a nearly straight dark line; waved antemedial and postmedial lines; a diffused irregularly sinuous subterminal line; the termen tinged with rufous. Hindwing sometimes blackish; an obliquely curved antemedial line, defined by whitish on outer side; a nearly straight medial line; a diffused subterminal line expanding into a large black spot below vein 4 with two whitish spots beyond it or whitish subterminal band.

Hab. **Natal,** Estcourt (Hutchinson); **Basutoland,** Maseru (Crawshay); **Cape Colony,** Annshaw (Miss F. Barrett). *Exp.* 20–22 mill. Type in B.M.

(13) METACHROSTIS NIGROVIRIDIS, n. sp.

Head and fore half of thorax black, the hinder half apple-green;

pectus, legs, and abdomen ochreous irrorated with fuscous. Forewing apple-green; the costa black at base; an oblique sinuous antemedial line arising from a black point on costa; reniform small, blackish; the postmedial line arising from a black point on costa, bent outwards from below costa to vein 4, then incurved; the terminal area blackish except the costal area extending on inner side of the postmedial line to the reniform. Hindwing fuscous black. Under side of forewing with the costal area irrorated with rufous, its apical part ochreous; hindwing ochreous irrorated with rufous and with discoidal point and curved postmedial line.

Hab. **British Central Africa,** Chinde, M'pondas (de Jersey); **Natal,** Northdene; **Cape Colony,** Transkei, Annshaw (Miss F. Barrett). *Exp.* ♂ 20, ♀ 22 mill.

(14) Metachrostis absciss, Wlk. xv. 1764 (1858).
Erastria fasciata, Wllgrn. Wien. Ent. Mon. iv. p. 173 (1860).
Hab. **Natal,** Durban (Gooch, Leigh); **Cape Colony.** *Exp.* ♂ 22, ♀ 26 mill.

(15) Metachrostis decissima, Wlk. xxxiii. 805 (1865).
Erastria africana, Feld. Reis. Nov. pl. 108, f. 6 (1874).
Hab. **British East Africa,** Eb. Urru; **Natal** (Burrows, Trimen), Victoria District (Gooch). *Exp.* 24 mill.

(16) Metachrostis semipurpurea, n. sp.

♂. Head and thorax deep purple brown; palpi whitish below at base; pectus and legs ochreous white thickly irrorated with fuscous; abdomen dorsally fuscous with pale segmental lines, the ventral surface whitish with fuscous irroration, the anal tuft ochreous. Forewing with the basal half deep purple brown, with traces of several waved lines, its outer edge oblique from costa to lower angle of cell where it is obtusely angled; the outer half grey with a black point just beyond the cell; the postmedial line excurved from below costa to vein 4, then incurved and with a similar line beyond it not so bent inwards towards costa; a slightly sinuous subterminal line; a terminal punctiform black line expanding into a diffused mark below apex. Hindwing dark brown with fine pale line at base of cilia. Under side with the costal area and the hindwing pale ochreous thickly irrorated with brown, the latter with discoidal point and curved postmedial line.

♀. Head, thorax, and basal half of forewing black-brown, the last with the ground colour of terminal half ochreous brown.

Hab. **Mashonaland,** Salisbury (Marshall); **Cape Colony,** Annshaw (Miss F. Barrett). *Exp.* 24 mill. Type in B.M.

(17) Metachrostis consanguis, n. sp.

♀. Head and thorax black slightly mixed with ochreous scales; pectus and legs ochreous irrorated with black; abdomen ochreous dorsally suffused with fuscous and ventrally irrorated with fuscous. Forewing with the basal area to near middle black edged by a whitish line which is angled outwards on median nervure well before end of cell and inwards in submedian fold and with a waved antemedial line on it; a small black discoidal lunule; the terminal half pinkish to the very indistinct postmedial line which is bent outwards from below costa to vein 4, then ferruginous brown to the indistinct dentate subterminal line, the termen pinkish with fuscous patches above middle and tornus; a crenulate black terminal line. Hindwing fuscous brown; the cilia mixed with ochreous. Under side with the costal area of forewing and the hindwing ochreous thickly irrorated with brown, the latter with discoidal point and curved postmedial line.

Hab. **N'Gamiland** (Lugard). *Exp.* 24 mill. Type in B.M.

(18) Metachrostis bipartita, n. sp.

♀. Head and thorax pale olive-brown, in one specimen tinged with pink; pectus, legs, and abdomen pale, strongly irrorated with dark brown. Forewing with the basal half pale olive, in one specimen tinged with pink with two antemedial black points on costa giving rise to two very indistinct waved lines and bounded by a line which is angled outwards to lower angle of cell, then incurved and with a blackish shade on its inner side; the terminal half dark brown, strongly irrorated and suffused with silvery grey; a black discoidal point; an indistinct waved subterminal line expanding into a small triangular spot on costa. Hindwing fuscous brown with fine pale line at base of cilia. Under side with the costal area of forewing and the hindwing pale ochreous thickly irrorated with brown, the latter with dark discoidal point and curved postmedial line.

Hab. **British East Africa,** Neugia (Crawshay); **Mashonaland,** Salisbury (Marshall); **Cape Colony,** Transkei (Miss F. Barrett). *Exp.* 26 mill. Type in B.M.

(19) Metachrostis punctigera, Wlk. xxii. 685 (1865). Hmpsn. Ill. Het. B.M. viii. pl. 143, f. 6.

Hab. **Mashonaland,** Salisbury (Marshall); **Japan; China; India; Australia.** *Exp.* 26–32 mill.

(20) Metachrostis cornicularis, Wllgrn. Wien. Ent. Mon. iv. p. 173 (1860).

Erastria figurata, Wlk. xxxiii. 793 (1865).

,, *nyanza,* Feld. Reis. Nov. pl. 120, f. 6 (1874).

Hab. **British East Africa,** Machakos, Kikuyu, Eb. Urru; **Mashonaland,** Salisbury (Marshall); **Natal,** Malvern (Marshall), Estcourt (Hutchinson), Victoria District (Gooch); **Cape Colony,** Knysna (Trimen). *Exp.* 24–28 mill.

(21) Metachrostis fusca, Hmpsn. Ill. Het. B.M. ix. p. 97, pl. 162, f. 9 (1893).

Hab. **Natal** (Gooch), Karkloof (Marshall), Durban (Leigh); **Cape Colony,** Transkei (Miss F. Barrett), Grahamstown; **Ceylon.** *Exp.* 28 mill.

(22) Metachrostis inobtrusa, n. sp.

Dark chocolate brown; abdomen fuscous brown; pectus, legs, and ventral surface of abdomen pale ochreous strongly irrorated with brown. Forewing with indistinct waved antemedial and medial lines; a discoidal point; the double postmedial line bent outwards from below costa to vein 3 and slightly angled inwards in discal and submedian folds; an irregularly waved greyish subterminal line; a terminal series of black points. Hindwing fuscous brown. Under side with the costal area of forewing and the hindwing pale ochreous strongly irrorated with brown and with discoidal point and curved postmedial line.

One specimen has the thorax and forewing to the medial line much greyer.

Hab. **Abyssinia; Cape Colony,** Transkei (Miss F. Barrett). *Exp.* 24 mill. Type in B.M.

(23) Metachrostis phæa, n. sp.

♀. Dark chocolate-brown; abdomen fuscous brown; palpi below, pectus, legs, and ventral surface of abdomen ochreous irrorated with brown. Forewing with indistinct waved antemedial and medial lines; a slight ochreous and black discoidal lunule; the postmedial line on a greyish ground, oblique from costa to vein 6 and angled inwards in submedian fold; an irregularly dentate grey subterminal line. Hindwing fuscous brown. Under side with the costal area of

forewing and the hindwing ochreous strongly irrorated with brown, the latter with discoidal point and curved postmedial line.

Hab. **Cape Colony,** Annshaw (Miss F. Barrett). *Exp.* 20 mill. Type in B.M.

(24) Metachrostis negrita, Hmpsn. Moths Ind. ii. p. 142 (1894).

Hab. **British East Africa,** Teita; **Cape Colony,** Annshaw (Miss F. Barrett); **India; Ceylon.** *Exp.* 14–16 mill.

(25) Metachrostis tritonia, n. sp.

♀. Head, thorax, and abdomen grey irrorated with fuscous. Forewing grey irrorated with black and purplish red scales, the outer half of costal area tinged with purplish red; the lines blackish; the antemedial line angled inwards in cell and on vein 1, outwards below the cell and above inner margin; a black discoidal spot placed on the medial line which is excurved from costa to median nervure, then incurved; the postmedial line minutely dentate, excurved below costa and at median nervules, angled inwards in discal and submedian folds; an indistinct irregular subterminal line. Hindwing grey suffused with fuscous brown.

Hab. **Mashonaland,** Umtali (Marshall). *Exp.* 38 mill. Type in B.M.

(26) Metachrostis snelleni, Wllgrn. Œfv. ak. k. Vet. Akad. Förh. 1875, p. 113.

Epizeuxis æthiops, Dist. Nat. in Transvaal, p. 239, pl. ii. f. 2 (1892).

Hab. **British East Africa,** Machakos; **Transvaal; Natal,** Karkloof (Marshall); **Basutoland,** Maseru (Crawshay); **Cape Colony,** Transkei, Annshaw (Miss F. Barrett). *Exp.* 22–30 mill.

(27) Metachrostis anticalis, Wlk. xxxiv. 1202 (1865).

Hab. **Natal** (Plant). *Exp.* 22 mill.

(28) Metachrostis rubripuncta, n. sp.

♂. Head and thorax black more or less strongly mixed with whitish; legs whitish banded with black; abdomen whitish dorsally tinged with fuscous brown. Forewing ochreous white more or less completely suffused with leaden fuscous and black, but leaving some whitish at base, beyond the antemedial

line and on terminal area; waved black subbasal, antemedial, medial, postmedial, and subterminal lines, the postmedial angled outwards at vein 7 and excurved at median nervules, then incurved, the subterminal dentate inwards above veins 6, 5, and 2; a red spot on inner side of medial line below the cell and a red discoidal spot on an irregular ochreous white patch extending to costa; a crenulate black terminal line; cilia ochreous white tinged with black above and below middle. Hindwing ochreous white suffused with fuscous below and beyond lower end of cell and on apical part of termen; a blackish streak on inner margin; minutely waved medial, postmedial, and subterminal lines almost obsolete except at median nervules and inner margin; a terminal series of small black lunules.

Hab. **British Central Africa,** Stevenson Road (Dewar); **Natal,** Durban (Leigh). *Exp.* 20–24 mill. Type in B.M.

Genus EUBLEMMA.

Type.

Eublemma, Hubn. Verz. p. 256 (1827) ... ... *respersa.*

Sect. I. Forewing of male with a postmedial glandular swelling on costa.

A. Wings with the cilia grey irrorated with black .. .. *fœdosa.*
B. Wings with the cilia grey tinged with fuscous .. .. *punctilinea.*

(1) Eublemma fœdosa, Guen. Noct. ii. p. 254 (1852).

Hab. **British East Africa,** Masailand; **Mashonaland,** Salisbury (Marshall); **Natal,** Estcourt (Hutchinson), Durban (Leigh). *Exp.* 22 mill.

(2) Eublemma punctilinea, n. sp.

Pale purplish grey irrorated with fuscous; head, tegulæ, and legs tinged with rufous. Forewing with blackish spot in cell before the indistinct waved antemedial line; a diffused somewhat annulate black discoidal spot; a punctiform medial line very oblique from costa to beyond upper angle of cell, then inwardly oblique; a dentate postmedial line strongly excurved from costa to vein 4, then incurved; a sinuous subterminal series of points and a terminal series. Hindwing with indistinct medial line from lower angle of cell to inner margin, ill-defined postmedial and subterminal series of points and a terminal series; cilia of both wings grey tinged with fuscous.

Hab. **Natal,** Durban (Leigh); **Cape Colony,** Transkei (Miss F. Barrett). *Exp.* 18 mill. Type in B.M.

Sect. II. Forewing of male without costal swelling.

A. Forewing with oblique antemedial line.. .. .. *trifasciata.*
B. Forewing without oblique antemedial line.
  a. Forewing with oblique medial line or band not angled below costa.
    a^1. Forewing with the basal area chestnut-brown .. .. *sperans.*
    b^1. Forewing with the basal area bright yellow .. .. .. *anachoresis.*
    c^1. Forewing with the basal area ochreous or yellowish white.
      a^2. Forewing with the postmedial line slightly excurved below costa.
        a^3. Forewing with the postmedial line dentate outwards at middle .. .. *ornatula.*
        b^3. Forewing with the postmedial line not dentate at middle .. .. *sabia.*
      b^2. Forewing with the postmedial line strongly excurved below costa.
        a^3. Forewing with the area beyond the postmedial line strongly tinged with pink .. .. *rosita.*
        b^3. Forewing with the area beyond the postmedial line tinged with brown .. .. *rivula.*
        c^3. Forewing with the area beyond the postmedial line pale ochreous .. .. *flavida.*
  b. Forewing with oblique medial line very strongly angled backwards to costa .. .. *versicolor.*
  c. Forewing without oblique medial line.
    a^1. Forewing with the basal area pure white.
      a^2. Forewing with the termen white.. .. .. *ecthæmata.*
      b^2. Forewing with the termen grey, whitish towards apex .. .. *scitula.*
      c^2. Forewing with the terminal half blackish.
        a^3. Forewing with short white streaks on the veins of termen .. .. *bipartita.*
        a^3. Forewing without white streaks on the veins of termen.. .. .. *leucomelæna.*
    b^1. Forewing with the basal area tinged with brown or grey.
      a^2. Forewing with more or less distinct transverse lines.
        a^3. Forewing without green patch on terminal area.
          a^4. Forewing with the basal area white irrorated with rufous .. .. *delicata.*
          b^4. Forewing with the basal area white suffused with grey .. .. *pennula.*
          c^4. Forewing with the basal area dark or suffused with dark brown.
            a^5. Forewing with reticulate white subapical lines .. .. *plagiopera.*
            b^5. Forewing without reticulate subapical lines.
              a^6. Forewing with irregular whitish subterminal line .. .. *staudingeri.*
              b^6. Forewing with white apical patch and subterminal points .. .. *apicata.*
              c^6. Forewing without white markings on terminal area .. .. *nigrivitta*
        b^3. Forewing with wedge-shaped green patch on terminal area .. .. *admota.*
      b^2. Forewing without transverse lines.

a^3. Forewing leaden-grey with yellow costal fascia .. *plumbosa.*
b^3. Forewing ochreous or grey-white.
a^4. Forewing with white streak on median nervure .. .. *flaviceps.*
b^4. Forewing without white streak on median nervure.
a^5. Wings strongly irrorated with fuscous; forewing with terminal dark points .. *penicillata.*
b^5. Wings with hardly a trace of fuscous irroration; forewing without terminal points .. .. *uninotata.*

(3) Eublemma trifasciata, Moore, P.Z.S., 1881, p. 370, pl. 38, f. 21.
Hab. **British East Africa,** Machakos; **British Central Africa; Cape Colony,** Transkei (Miss F. Barrett); **Persia; India; Ceylon; New Hebrides.** *Exp.* 22 mill.

(4) Eublemma sperans, Feld. Reis. Nov. pl. 108, f. 9 (1874).
Hab. **Cape Colony** (Trimen), Annshaw (Miss F. Barrett). *Exp.* 18 mill.

(5) Eublemma anachoresis, Wllgrn. Wien. Ent. Mon. vii. p. 198 (1863).
Thalpochares divisa, Moore, P.Z.S. 1881, p. 371, id. Lep. Ceyl. iii. pl. 150, f. 10.
Hab. **West Africa,** Accra; **British East Africa; British Central Africa; Delagoa Bay** (Mrs. Monteiro); **Natal,** Estcourt (Hutchinson); **Basutoland,** Masite, Maseru, Letloenyas (Crawshay); **Cape Colony,** Annshaw (Miss F. Barrett); **India; Ceylon.** *Exp.* 18 mill.

(6) Eublemma ornatula, Feld. Reis. Nov. pl. 18, f. 19 (1874).
Hab. **Natal,** Estcourt (Hutchinson); **Basutoland,** Maseru, Machacha (Crawshay); **Cape Colony** (Trimen). *Exp.* 16 mill.

(7) Eublemma sabia, Feld. Reis. Nov. pl. 108, f. 16 (1874).
Hab. **Cape Colony,** Annshaw (Miss F. Barrett). *Exp.* 16–18 mill.

(8) Eublemma rosita, Guen. Noct. ii. p. 245 (1852). Moore, Lep. Ceyl. iii. pl. 150, f. 18.
Hab. **West Africa,** Accra; **Mashonaland,** Salisbury (Marshall) **Arabia; India; Ceylon; Formosa; Australia.** *Exp.* 14 mill.

(9) Eublemma rivula, Moore, Lep. Atk. p. 140 (1879).
Micra chalybea, Swinh. P.Z.S. 1884, p. 518, pl. 47, f. 10.

Hab. **British East Africa,** Machakos; **British Central Africa; N'Gamiland** (Lugard); **Natal,** Estcourt (Hutchinson); **India; Sambawa; Australia; Fiji.** *Exp.* 14 mill.

(10) Eublemma flavida, n. sp.

♂. Head and thorax white, the latter tinged with pale lemon-yellow; abdomen ochreous white slightly tinged with fuscous on dorsum. Forewing pale ochreous tinged with lemon-yellow on basal area; an oblique pale rufous medial line; a postmedial line strongly angled outwards below costa where it is joined by an oblique streak from apex, curved to vein 4, then oblique to inner margin near the medial line; a curved sinuous subterminal line; a fine terminal line; cilia tinged with rufous at tips. Hindwing white tinged with fuscous, especially on terminal area; cilia ochreous white.

Hab. **Cape Colony,** Annshaw, Transkei (Miss F. Barrett). *Exp.* 20 mill. Type in B.M.

(11) Eublemma versicolor, Wlk. Journ. Linn. Soc. Zool. vii. p. 58 (1863).

Mestleta angulifera, Moore, Lep. Atk. p. 179 (1882). id. Lep. Ceyl. iii. pl. 175, f. 2, 2*a*.

Hab. **Mashonaland,** Salisbury (Marshall); **India; Ceylon; Borneo.** *Exp.* 24 mill.

(12) Eublemma ecthæmata, Hmpsn. P.Z.S. 1896, p. 262, pl. x. f. 6.

Hab. **Aden; Natal,** Estcourt (Hutchinson). *Exp.* 18 mill.

(13) Eublemma scitula, Ramb. Ann. Soc. Ent. Fr. 1833, p. 26, pl. 2, f. 16.

Eublemma futilis, Swinh. P.Z.S. 1884, p. 517, pl. 47, f. 8.

,, *cretacea,* Hmpsn. Ill. Het. B.M. ix. p. 96, pl. 162, f. 17, (1893).

Hab. **Southern Europe; North Africa; Gold Coast,** Accra; **British Central Africa,** Likoma; **Basutoland,** Maseru (Crawshay); **India; Ceylon.** *Exp.* 16–18 mill.

(14) Eublemma bipartita, n. sp.

♂. Head, thorax, and abdomen creamy white; palpi at sides, antennæ and abdomen tinged with fuscous. Forewing with the basal half creamy white, its outer edge oblique from costa to median nervure where it is acutely angled, then retracted; some fuscous marks on base of costal area and an indistinct waved subbasal line

with a black point in cell beyond it; the terminal half black-brown suffused with bluish white scales; the postmedial line whitish, angled inwards below costa, then excurved to vein 5 where it is again angled inwards, excurved to vein 3, then strongly incurved; an irregularly dentate white subterminal line with three black points beyond it below apex and one above tornus; a series of short white streaks on the terminal part of veins; cilia white. Hindwing white, tinged with fuscous towards termen; a fine terminal black line; cilia white.

Hab. **Transvaal** (Ross). *Exp.* 24 mill. Type in B.M.

(15) Eublemma leucomelana, n. sp.

Head, thorax, and abdomen pure white; fore tibiæ tinged with brown; tarsi brown with white rings. Forewing with the basal half white, its outer edge dentate outwards on median nervure; some slight fuscous marks on basal part of costal area and an indistinct subbasal line with a black point beyond it in cell; the terminal half black-brown tinged with blue-grey and with traces of a dentate line near its inner edge; a black discoidal striga; the postmedial line dark with a white mark on costa, excurved to vein 5 where it is angled inwards, excurved to vein 3, then strongly incurved; an irregular brownish subterminal line with a series of black points on it; two white points on costa towards apex; cilia white and pale rufous. Hindwing white, the terminal area tinged with fuscous; a fine terminal black line.

Hab. **Cape Colony,** Annshaw (Miss F. Barrett). *Exp.* 18 mill. Type in B.M.

(16) Eublemma delicata, Feld. Reis. Nov. pl. 108, f. 13 (1874).
Hab. **Cape Colony** (Trimen), Annshaw (Miss F. Barrett). *Exp.* 16 mill.

(17)*Eublemma pennula, Feld. Reis. Nov. pl. 108, f. 12 (1874).
Hab. **Cape Colony.** *Exp.* 22 mill.

(18) Eublemma plagiopera, n. sp.

♂. Head and tegulæ white; palpi and antennæ tinged with brown; thorax white, purplish brown and pale red; abdomen white suffused with brown leaving white dorsal segmental lines. Forewing white strongly irrorated with brown; a white antemedial line bent inwards to inner margin; a ferruginous tinge on medial area; the postmedial line oblique from costa to vein 3 near termen, then bent strongly inwards to submedian fold and erect to inner margin; a

blackish patch edged with white on costa before apex; the subterminal white line oblique from costa to the postmedial line below the white-edged black patch, then excurved to near termen to which it is parallel to inner margin; cilia very pale rufous. Hindwing white tinged with pale brown, especially towards termen; a black spot on white area beyond middle and a white point at tornus.

♀. The greater part of thorax, abdomen, and forewing strongly suffused with ferruginous; hindwing suffused with dark brown.

Cocoon formed of the exuviæ of *Coccids*.

Hab. **Natal; Cape Colony**, Annshaw (Miss F. Barrett). *Exp.* ♂ 18, ♀ 24 mill. Type in B.M.

(19) Eublemma staudingeri, Wllgrn. Œfv. af. k. Vet. Akad. Förh. 1875, p. 113.

Thalpochares squamilinea, Feld. Reis. Nov. pl. 108, f. 14 (1874).

Eublemma pretoriæ, Dist. A.M.N.H. (7) i. p. 225 (1898).

Hab. **Transvaal; Natal**, Estcourt (Hutchinson). *Exp.* 26 mill.

(20) Eublemma apicata, Dist. A.M.N.H. (7) i. p. 225 (1898).

Hab. **British Central Africa**, Likoma; **Mashonaland**, Salisbury (Marshall); **Transvaal; Natal**, Weenen; **Cape Colony**, Annshaw, Transkei (Miss F. Barrett). *Exp.* 18–24 mill.

(21) Eublemma nigrivitta, n. sp.

Pale reddish brown; palpi blackish at sides; abdomen dorsally banded with fuscous. Forewing usually suffused with black to the medial line, sometimes entirely suffused; waved antemedial, medial, and postmedial lines, the first angled outwards in submedian fold, the second and third inwards and the third outwards on veins 6 and 4; an obscure orbicular point and small reniform stigma; a sinuous subterminal line with three or four short black streaks beyond it on apical half; a fine black terminal line; cilia chequered pale brown and fuscous. Hindwing ochreous with fine blackish medial, postmedial, and subterminal black lines, the two latter with diffused fuscous band between them and all obsolescent on costal area; a fine black terminal line.

Hab. **Cape Colony**, Annshaw (Miss F. Barrett). *Exp.* 24 mill. Type in B.M

(22) Eublemma admota, Feld. Reis. Nov. pl. 108, f. 31 (1874).

Hab. **Abyssinia; Sokotra; British East Africa**, Machakos, Sambaru; **N'Gamiland** (Lugard); **Transvaal** (Marshall); **Natal**, Estcourt (Hutchinson). *Exp.* ♂ 26, ♀ 34 mill.

(23) Eublemma plumbosa, Dist. A.M.N.H. (7) iii. p. 462 (1899).
Hab. **Mashonaland,** Salisbury (Marshall); **Transvaal** (Distant).
Exp. 22 mill.

(24) Eublemma flaviceps, n. sp.
♀. Head, thorax, and abdomen white tinged with grey; palpi pale rufous at sides; back of head and tegulæ pale sulphur-yellow. Forewing grey-white irrorated with brown; the base of costal area white; the median nervure and vein 1 streaked with pale sulphur-yellow; an oblique streak from apex with some yellowish before it; a subterminal series of black points formed each by a few scales; a brown terminal line. Hindwing white very slightly tinged with brown.
Hab. **Mashonaland,** Salisbury (Marshall). *Exp.* 18 mill. Type in B.M.

(25) Eublemma penicillata, n. sp.
♂. Grey-white irrorated with brown; palpi, head, tegulæ, and shoulders tinged with rufous. Forewing with diffused dark discoidal spot; the costa towards apex brown; a diffused brown streak from apex toward lower angle of cell; some rufous on termen and a series of dark points; cilia fuscous. Hindwing strongly irrorated and suffused with brown towards termen.
♀. Almost entirely irrorated and suffused with fuscous brown.
Hab. **Natal,** Malvern (Marshall). *Exp.* 24 mill. Type in B.M.

(26) Eublemma uninotata, n. sp.
♂. Head, thorax, and abdomen white; palpi tinged with pale rufous. Forewing yellowish white; a dark discoidal point; the subterminal line represented by a few dark scales. Hindwing yellowish white.
Hab. **Natal,** Estcourt (Hutchinson). *Exp.* 38 mill. Type in B.M.

Genus TROCTOPTERA.

Type.
Troctoptera, Hmpsn. Ill. Het. B.M. ix. p. 99
(1893) ... ... *erubescens.*

Tractoptera erosides, n. sp.
♂. White. Forewing with minute fuscous points on base of costa; subbasal fuscous spot on inner margin; an antemedial line angled outwards below costa and cell; a black point in cell near

lower extremity; a diffused maculate postmedial fuscous band, angled outwards at veins 6 and 4, then bent inwards to middle of inner margin; two obscure sinuous punctiform subterminal lines with larger spots at costa and inner margin; cilia brown at middle. Hindwing with medial band formed by two lines with some brown on their edges, angled outwards below costa, and approximated towards inner margin and with a black point between them at lower angle of cell; a diffused fuscous and brown subterminal band from costa to vein 2; a spot on inner margin near tornus.

Hab. **Natal**, Victoria District. *Exp.* 16 mill. Type in B.M.

Sub-Family HYPENINÆ.

A. Forewing with vein 9 from 10 anastomosing with 8 to form the areole.
  a. Palpi with the second joint not fringed with hair above, upturned.
    a^1. Palpi with the second joint broadly scaled in front.
      a^2. Palpi with the third joint moderate, blunt.
        a^3. Hindwing with the termen strongly angled at middle .. .. *Episparis.*
        b^3. Hindwing with the termen excurved at middle *Disticta.*
      b^2. Palpi with the third joint long, acute .. .. .. *Pseudaglossa.*
    b^1. Palpi with the second joint smoothly scaled in front.
      a^3. Palpi with tuft of hair on inner side of third joint *Egnasia.*
      b^3. Palpi with the third joint naked .. .. *Zethes.*
  b. Palpi with the second joint porrect or oblique and fringed with hair above, the third more or less upturned and naked at extremity.
    a^1. Palpi with the third joint naked .. .. *Magulaba.*
    b^1. Palpi with the third joint tufted with scales.
      a^2. Abdomen with dorsal crests.. .. .. *Hypena.*
      b^2. Abdomen without dorsal crests.
        a^3. Palpi with the second joint porrect .. .. .. *Rhynchina.*
        b^3. Palpi with the second joint oblique; abdomen of male with lateral tufts of hair towards extremity .. .. *Rhæsena.*
  c. Palpi rostriform, the third joint downturned and clothed with hair to extremity.
    a^1. Palpi with the second joint fringed with long hair above *Naarda.*
    b^1. Palpi smoothly clothed with hair .. .. *Leiorhynx.*
B. Forewing without an areole.
  a. Forewing with veins 7, 8, 9, 10 stalked.
    a^1. Forewing with veins 4, 5 stalked, the cell short .. .. *Hydrillodes.*
    b^1. Forewing with veins 4, 5 from cell .. .. *Nodaria.*
  b. Forewing with veins 8, 9, 10 stalked, 7 from cell.. .. .. *Alelimma.*
  c. Forewing with veins 8, 9 stalked, 7 and 10 from cell .. .. *Tetracme.*

Genus EPISPARIS.

Type.

Episparis, Wlk. x. 475 (1856) ... ... *liturata.*

Episparis leucotessellis, n. sp.

♂. Head and thorax pale red-brown; edges of tegulæ and patagia with a few white scales; pectus and legs white and pale brown; abdomen pale brown. Forewing pale reddish brown; a somewhat diffused dark brown antemedial line acutely angled outwards below costa and slightly in submedian fold; an indistinct waved media line; the medial area irrorated with dark brown below the cell; the postmedial line formed by indistinct small dark brown lunules with white on their outer edges, bent outwards from below costa to vein 3; a series of somewhat lunulate white spots curved from just below apex to termen at vein 2 and with others beyond them on veins 3 and 4; the terminal area greyish brown with some rufous suffusion with dark brown suffusion below it on apical area; cilia white from vein 4 to above tornus; the termen slightly angled at vein 5. Hindwing rufous and purplish brown thickly striated with white except on apical area, and with white patch on termen between veins 4 and 1; small white spots above and below vein 2 before the indistinct waved postmedial line; cilia with white lunules in the excavations between vein 4 and tornus. Under side white slightly irrorated with brown and the apical area of forewing tinged with brown; both wings with discoidal points and irregularly waved medial and postmedial lines, the former bent outwards round cell of forewing.

Hab. **Delagoa Bay** (Junod). *Exp.* 34 mill. Type in B.M.

Genus DISTICTA, nov.

Proboscis fully developed; palpi obliquely upturned, extending about the length of head, the second joint roughly scaled, the third short with some rough scales at base; frons without tuft; antennæ bipectinate in both sexes; fore tibiæ thickly fringed with long hair. Forewing with the apex produced and acute, the termen strongly excurved at middle; veins 3 and 5 from near angle of cell; 6 from upper angle; 9 from 10 anastomosing with 8 to form the areole; 11 from cell. Hindwing with the termen excurved at middle; veins 3, 4 from angle of cell; 5 fully developed from well above angle; 6, 7 from upper angle.

Disticta atava, Feld. Reis. Nov. pl. 119, f. 4 (1874).

Hab. **Natal,** Victoria District (Gooch), Durban (Bowker); **Cape Colony,** Knysna (Trimen). *Exp.* 32–38 mill.

Genus PSEUDAGLOSSA.

Type.

Pseudaglossa, Grote, Bull. Buff. Soc. Nat. Sci. ii. p. 47 (1874) ... ... *lubricalis.*

A. Forewing with the small orbicular and reniform stigmata prominent, whitish .. .. *gigantalis.*
B. Forewing with the orbicular absent, the discoidal lunule blackish.
a. Wings with an ochreous tinge suffused with fuscous .. .. *auge.*
b. Wings greyish thickly irrorated with fuscous .. .. *pulverea.*
C. Forewing without discoidal lunule .. .. *nubifera.*

(1) Pseudaglossa gigantalis, n. sp.

Head, thorax, and abdomen fuscous brown; wings silky fuscous brown. Forewing with rather indistinct whitish highly waved antemedial line; the orbicular and reniform small whitish with dark outline; the former round and placed in a sinus of antemedial line, the latter upright elliptical; a dentate whitish postmedial line, excurved from below costa to vein 4, then incurved and bent outwards at vein 1; a dentate whitish subterminal line bent outwards at vein 7, angled inwards in discal fold and incurved below vein 3. Hindwing with rather indistinct whitish dentate medial and subterminal lines, the former excurved at middle. Under side with slight discoidal lunules and more regular postmedial and subterminal lines.

Hab. **Cape Colony,** Annshaw (Miss F. Barrett). *Exp.* 48–54 mill. Type in B.M.

Subsp. 1.

♂. Forewing with the medial area more or less strongly suffused with white; hindwing white with dark dentate medial and subterminal lines and some dark suffusion on termen.

♀. As in the typical form.

Hab. **British East Africa,** Nairowa, Eb. Urru, Kambi (Betton), Kikuyu (Crawshay).

(2) Pseudaglossa auge, n. sp.

Head, thorax, and abdomen fuscous brown. Forewing yellowish brown suffused with fuscous; an indistinct obliquely sinuous antemedial line; a blackish discoidal lunule with some ochreous on its outer edge; a minutely dentate postmedial line angled inwards in discal fold, incurved below vein 3 and bent outwards at vein 1; an irregularly dentate ochreous subterminal line with prominent dark suffusion before it, angled outwards at vein 7 and 4 and inwards in discal and submedian folds; a terminal series of dark points. Hind-

wing fuscous brown, yellowish towards costa; indistinct diffused medial and postmedial dark lines; the termen darker with a series of dark points; the under side with small discoidal spot.

Hab. **Cape Colony,** Annshaw (Miss F. Barrett). *Exp.* ♂ 34, ♀ 40 mill. Type in B.M.

(3) Pseudoglossa pulverea, n. sp.

Head, thorax, and abdomen grey thickly irrorated with fuscous brown; palpi and frontal tuft deep black. Forewing greyish brown strongly irrorated with fuscous brown; an indistinct dentate antemedial line with oblique black striga at costa; a small black discoidal lunule; the postmedial line minutely dentate, excurved from below costa to vein 4, then incurved and bent outwards at vein 1; an obscure ochreous subterminal line with dark suffusion before it, angled outwards at vein 7 and excurved at middle; a terminal series of dark points. Hindwing greyish thickly irrorated with fuscous; a slight discoidal spot and curved minutely dentate medial line; an indistinct pale dentate subterminal line with black suffusion on each side of it; a terminal series of black points.

Hab. **Natal,** Durban (Leigh); **Basutoland,** Maseru, Morija (Crawshay); **Cape Colony,** Annshaw (Miss F. Barrett). *Exp.* 30 mill.

(4) Pseudaglossa nubifera, n. sp.

♀. Head and thorax brown mixed with black; abdomen fuscous black. Forewing brown suffused and irrorated with black; indistinct waved ante- and post-medial lines; a diffused medial shade; an indistinct waved subterminal line excurved above vein 6 and at middle and with black spot on its inner side above vein 6; a terminal series of small black spots. Hindwing deep fuscous; the under side grey thickly irrorated with black, a black discoidal spot and diffused postmedial line and terminal band.

Hab. **Natal,** Durban (Leigh). *Exp.* 28 mill. Type in B.M.

Genus EGNASIA.

Type.

Egnasia, Wlk. xvi. 216 (1858) ... ... *ephyrodalis.*

Egnasia vicaria, Wlk. xxxv. 1972 (1866).

Hab. **West Africa,** Congo; **British East Africa,** Kikuyu, Tanga; **British Central Africa,** Chiromo; **Mashonaland,** Salisbury (Marshall); **Natal,** Victoria District (Gooch); **Cape Colony,** Annshaw (Miss F. Barrett). *Exp.* 32 mill.

AUCTORUM.

Gracillodes fumipennis, Feld. Reis. Nov. pl. 119, f. 29 (1874). Type lost ... ... Natal.

GENUS ZETHES.

Type.

Zethes, Ramb. Ann. Soc. Ent. Fr. 1833, p. 29 *insularis*.

A. Hindwing with white mark near tornus .. .. *caffra*.
B. Hindwing without white mark near tornus .. .. *arida*.

(1) ZETHES CAFFRA, Guen. Noct. iii. p. 370 (1852).

Hab. **East Africa**, Dar-es-salem; **British Central Africa**, Chiromo; **Natal**, Claremont, Malvern (Marshall), Durban (Gooch, Leigh); **Mauritius**. *Exp.* 36–48 mill.

(2) ZETHES ARIDA, n. sp.

♂. Brownish ochreous irrorated with fuscous. Forewing with curved brown antemedial line strongly incurved in cell; a dark point in middle of cell and slight discoidal lunule; the medial line bent outwards round end of cell, then oblique; the postmedial line minutely waved, angled outwards at veins 7 and 4, then incurved; an indistinct sinuous subterminal line with traces of a dentate line beyond it; a fine dark terminal line. Hindwing with oblique antemedial line slightly angled below costa; traces of a waved medial line and of a curved postmedial line with dentate line beyond it; a fine dark terminal line. Under side of forewing with medial line angled outwards below costa, postmedial line incurved in discal fold and below vein 4, and slightly sinuous subterminal line; hindwing with antemedial line slightly angled outwards below costa and minutely waved medial and subterminal lines, the former incurved in discal fold.

Hab. **Natal**, Victoria District (Gooch). *Exp.* 30 mill. Type in B.M.

AUCTORUM.

Bleptina intractalis, Wlk. Trans. Ent. Soc. (3) i. p. 114 (1862). Type lost ... ... Cape Colony.
Bleptina frontalis, Wlk. Trans. Ent. Soc. (3) i. p. 114 (1862). Type lost ... ... Cape Colony.

Genus MAGULABA.

Type.

Magulaba, Wlk. xxxiv. 1126 (1865) ... ... *imparata.*

A. Forewing with apical black spot .. .. *imparata.*
B. Forewing without apical black spot .. .. *goleta.*

(1) Magulaba imparata, Wlk. xv. 1777 (1858).
„ *mœstalis*, Wlk. xxxiv. 1126 (1865).
Hab. **West Africa,** Sierra Leone, Nigeria; **British East Africa,** Kikuyu, Eb. Urru, Kitwi, Neugia, Teita; **Mashonaland,** Salisbury (Marshall); **Damaraland,** Ovampo Land (Erikson); **Natal,** Durban (Bowker, Leigh); **Aden**; **Japan**; **Corea**; **India**; **Ceylon**; **Andamans**; **Singapore**; **Bali**; **New Guinea.** *Exp.* 18–24 mill.

(2) Magulaba goleta, Feld. Reis. Nov. pl. 120, f. 5 (1874).
Hab. **Natal,** Northdene. *Exp.* 28 mill.

Genus HYPENA.

Type.

Hypena, Schrank, Fauna Boica, ii. 2, p. 163 (1802) ... ... *rostralis.*

A. Forewing with the postmedial line nearly straight, erect, and slightly angled at veins 6 and 4 .. .. *erastialis.*
B. Forewing with the postmedial line angled outwards at veins 6 and 4, then waved.
a. Forewing with the postmedial line very oblique and highly waved below vein 4 .. .. *polycyma.*
b. Forewing with the postmedial line slightly oblique and waved below vein 4.
a^1. Forewing with the oblique mark from apex ochreous .. *derasalis.*
b^1. Forewing with the oblique mark from apex bluish grey *strigata.*
c. Forewing with the postmedial line incurved below vein 4 .. *megaproctis.*
C. Forewing with the postmedial line excurved beyond the cell and at vein 2.
a. Forewing with the medial area below the cell deep black .. *mesomelæna.*
b. Forewing with the medial inner area brown.
a^1. Forewing with pale fascia from base of costa to vein 1 in submedian fold .. .. *varialis.*
b^1. Forewing without pale fascia .. .. *holophœa.*
D. Forewing with the postmedial line excurved from costa to vein 4, then incurved.. .. .. *inconspicua.*
E. Forewing with the postmedial line slightly curved from costa to vein 4, then very oblique .. .. *namaqualis.*
F. Forewing with the postmedial line obliquely curved from costa to vein 1, then retracted to base .. .. *potamistis.*
G. Forewing with the postmedial line straight and oblique.
a. Forewing with the postmedial line moderately oblique.
a^1. Forewing with the ground colour black-brown .. .. *melanistis.*

b^1. Forewing pale reddish brown striated with fuscous .. *rectivittalis.*
c^1. Forewing chestnut-brown, the terminal area suffused with blue-grey .. .. *ectoglauca.*
b Forewing with the postmedial line very oblique.
a^1. Forewing chestnut-brown the terminal area suffused with blue-grey .. .. *lividalis.*
b^1. Forewing grey-brown irrorated with black .. .. .. *masurialis.*

(1) Hypena erastialis, Wlk. xxxiv. 1135 (1865).
,, *velatipennis*, Butl. A.M.N.H. (4) xvi. p. 410 (1875).
Hab. **Natal**, Durban (Burrows, Leigh). *Exp.* 26–30 mill.

(2) Hypena polycyma, n. sp.
♀. Dark brown. Forewing striated with black; the Natal specimen with pale olive fascia in submedian fold and suffusion on terminal area; an indistinct brown antemedial line very oblique from costa to vein 1 where it is acutely angled outwards to join the postmedial line, and slightly angled on median nervure; the tufts of scales in and below middle of cell and on discocellulars black; the postmedial line angled outwards on veins 6 and 4 then dentate and very oblique; a pale curved mark from apex with black spot on its inner edge; a subterminal series of obscure black and grey spots conjoined to termen by slight streaks; a terminal series of black points. Hindwing uniform dark brown. Under side of forewing with black subapical point on pale patch; hindwing with discoidal point and curved postmedial line.
Hab. **British East Africa**, Munisu (Lord Delamere); **Natal** (Burrows). *Exp.* 34 mill. Type in B.M.

(3) Hypena derasalis, Guen. Delt. and Pyr. p. 27, pl. 4, f. 2 (1854).
,, *senialis*, Guen. Delt. and Pyr. p. 30 (1854).
,, *vulgatalis*, Wlk. xvi. 82 (1858).
,, *palpitralis*, Wlk. xvi. 82 (1858).
,, *disclusalis*, Wlk. xxxiv. 1136 (1865).
Hab. **Sokotra**; **British East Africa**, Munisu, Kikuyu, Machakos, Eb.Urru, Athi-ya-Mawe; **Namaqualand**; **Natal**, Karkloof (Marshall), Victoria District (Gooch); **Cape Colony**, Knysna (Trimen). *Exp.* 30–34 mill.

(4) Hypena strigata, Fabr. Suppl. Ent. Syst. p. 467 (1798).
,, *abyssinialis*, Guen. Delt. and Pyr. p. 39 (1854).
,, *fumidalis*, Zell. Vet. Akad. Handl. 1852, p. 7 (1854).
,, *commixtalis*, Zell. Vet. Akad. Handl. 1852, p. 8 (1854).
,, *jussalis*, Wlk. xvi. 52 (1858)

Hab. **West Africa,** Congo; **Soudan**; **Abyssinia**; **Sokotra**; **British East Africa,** Kikuyu, Machakos, Eb. Urru, Muthambi; **British Central Africa,** Zomba, Chiromo; **Mashonaland,** Salisbury, Umtali (Marshall); **N'Gamiland** (Lugard); **Natal,** Durban (Gooch, Leigh); **Aden**; **India, Ceylon,** and **Burma**; **Singapore**; **Australia.** *Exp.* 32 mill.

(5) Hypena megaproctis, n. sp.

Antennæ of ♂ broken, (?) pectinate; abdomen of ♀ with very large anal tuft. Head and thorax purplish grey more or less mixed with brown; tarsi banded with ochreous; abdomen fuscous, the dorsal crest at base black, the anal tuft greyish ochreous. Forewing purple fuscous; a curved blackish antemedial line with a broad band of blackish suffusion beyond it below the cell; a waved medial line bent outwards in cell; a discoidal lunule defined by whitish scales; the postmedial line rather indistinct, waved, angled outwards at veins 6 and 4, then incurved; a dentate whitish subterminal line angled outwards at veins 6 and 4 and with four black spots beyond it between vein 4 and apex; a terminal series of black points. Hindwing fuscous brown with waved ochreous subterminal line and terminal series of black points; the under side greyish irrorated and suffused with brown, an indistinct discoidal point and waved medial, postmedial, and subterminal lines.

Hab. **Natal,** Durban (Leigh). *Exp.* ♂ 32, ♀ 36 mill. Type in B.M.

(5) Hypena mesomelæna, n. sp.

♂. Head, thorax, and abdomen brown mixed with black; palpi blackish. Forewing grey-brown irrorated with black; the medial area below the cell black defined on inner side by the white antemedial line and on outer by the white postmedial line which is slightly excurved just beyond the discocellulars and more strongly at vein 2; a black point in middle of cell, some black suffusion before the postmedial line and some deep black in the sinus beyond the cell; a subterminal series of white points with black marks on their inner edges increasing in size towards costa and with a diffused mark in discal fold, the series excurved from vein 7 to 4, then incurved; a slight oblique blackish mark from apex and a terminal series of black points. Hindwing dark brown. Under side of forewing with two white subapical points; hindwing with dark discoidal point and curved postmedial line.

Hab. **Cape Colony,** Transkei (Miss F. Barrett). *Exp.* 38 mill. Type in B.M.

(6) Hypena varialis, Wlk. xxxiv. 1132 (1865). Hmpsn. Ill. Het. B.M. ix. pl. 166, f. 13.

Hab. **British East Africa,** Samburu; **Natal** (Gueinzius, Gooch, Burrows); **Madagascar; Ceylon.** *Exp.* 26–32 mill.

(7) Hypena holophæa, n. sp.

♂. Head and thorax dark brown irrorated with grey; abdomen fuscous. Forewing red-brown finely irrorated with blue-grey; a waved antemedial brown line slightly defined by blue-grey; dark points in middle of cell and on discocellulars; the postmedial line excurved byond the cell and at vein 2 with another curved minutely waved line beyond it; traces of a subterminal series of dark spots; a terminal series of black points. Hindwing dark brown. Under side uniform dark brown.

Hab. **Natal,** Durban (Hutchinson). *Exp.* 36 mill. Type in B.M.

(8) Hypena inconspicua, Butl. A.M.N.H. (4) xvi. p. 413 (1875).

Hab. **Natal,** Northdene. *Exp.* 30 mill.

(9) Hypena namaqualis, Guen. Delt. and Pyr. p. 28 (1854).

,, *ægonalis*, Wlk. xvi. 230 (1858).

Hab. **Namaqualand; Cape Colony** (Dr. Smith), Heald Town, Annshaw (Miss F. Barrett). *Exp.* 32–36 mill.

(10) Hypena potamistis, n. sp.

Head and thorax pale or dark grey, sides of palpi and vertex and sides of thorax streaked with black; abdomen grey-brown or fuscous brown. Forewing pale grey-brown irrorated with black or dark grey suffused with black, the interspaces with indistinct dark streaks, the submedian interspace, the area before and beyond the postmedial line and the area below the apical mark darker, a black point in middle of cell with two streaks from it to the black defined white discoidal spot; the postmedial line white with a black line on its inner side and a faint or prominent white line on its outer side, obliquely curved from costa to vein 1 above which it is retracted to base; a subterminal series of small black spots, the two towards costa placed on an oblique white mark from apex; a terminal series of black points. Hindwing fuscous. Under side of forewing with two white subapical points; hindwing with indistinct discoidal point and curved postmedial line.

Hab. **British East Africa**, Kikuyu, Eb.Urru; **Mashonaland**, Salisbury (Marshall); **Cape Colony**, Transkei (Miss F. Barrett). *Exp.* 30–34 mill. Type in B.M.

(11) Hypena melanistis, n. sp.

♂. Fuscous black sparsely irrorated with grey, abdomen with greyish segmental lines. Forewing with diffused grey antemedial line, excurved below costa, then oblique; a tuft of black scales in middle of cell; an oblique almost straight grey postmedial line with a brown line on its inner edge; traces of an oblique greyish mark from apex. Under side of hindwing pale irrorated with brown, a black discoidal point and curved postmedial line.

Hab. **Cape Colony**, Transkei (Miss F. Barrett). *Exp.* 40 mill. Type in B.M.

(12) Hypena rectivittalis, Moore, P.Z.S. 1867, p. 84.
,, *beatalis*, Feld. Reis. Nov. pl. 120, f. 19 (1874).

Hab. **Natal**, Durban (Leigh); **Japan**; **India**. *Exp.* 30–32 mill.

(13) Hypena ectoglauca, n. sp.

Head blackish irrorated with grey, the antennæ with white spots on upper side of joints towards base; thorax rufous; abdomen grey-brown, the ventral surface paler. Forewing rufous with a cupreous tinge irrorated with darker scales; an indistinct waved antemedial line with a black point beyond it in cell; an oblique almost straight postmedial brown line with a white line on its outer edge; the terminal area suffused with bluish grey less prominently towards termen; a subterminal series of black and white points excurved at middle; a terminal series of black points. Hindwing fuscous brown. Under side uniform greyish brown.

Hab. **Mashonaland**, Salisbury, Umtali (Marshall); **Natal**, Malvern (Marshall), Durban (Gooch). *Exp.* 32 mill. Type in B.M.

(14) Hypena lividalis, Hübn. Samml. Eur. Schmett. Pyr. ff. 11, 186 (1827).

Hab. **West Indies**; **South America**; **Europe**; **Syria**; **Canaries**; **Sokotra**; **British East Africa**, Eb.Urru; **Namaqualand**, Ovampo Land (Erikson); **Natal**, Durban (Gooch, Leigh); **Cape Colony**, Grahamstown; **Aden**; **India**; **Burma**. *Exp.* 24 mill.

(15) Hypena masurialis, Guen. Delt. and Pyr. p. 38 (1854).
,, *simplicalis*, Zell. Vet. Akad. Handl. 1852, p. 10 (1854).

Hab. **Canaries; West Africa,** Sierra Leone, Congo; **Abyssinia; Sokotra; British East Africa,** Eb.Urru, Samburu; **Mashonaland,** Salisbury, Umtali (Marshall); **Natal,** Durban (Innes, Gooch); **Aden; India, Ceylon,** and **Burma; Australia; Fiji.** *Exp.* 24–30 mill.

AUCTORUM.

Hyamia subterminalis, Wlk. xxxiv. 1145 (1856). Type lost ... ... Cape Colony.
Hypena æmusalis, Wlk. Trans. Ent. Soc. (3) i. p. 109 (1862). Type lost ... ... Cape Colony.

GENUS RHYNCHINA.

	Type.
Rhynchina, Guen. Delt. and Pyr. p. 20 (1854)	*pionealis.*
Ceraptila, Guen. Delt. and Pyr. p. 24 (1854)	*reniferalis.*
Zekelita, Wlk. xxvii. 199 (1863)	*equalisella*

Sect. I. (*Ceraptila*). Antennæ of male bipectinate.

A. Forewing with oblique antemedial black band from cell to inner margin .. .. *reniferalis.*
B. Forewing without antemedial black band.
  a. Forewing with the postmedial line erect between vein 2 and inner margin .. .. *equalisella.*
  b. Forewing with the postmedial line oblique between vein 2 and inner margin .. .. *poliopera.*

(1) RHYNCHINA RENIFERALIS, Guen. Delt. and Pyr. p. 24 (1854).
Hab. **Cape Colony** (Dr. Smith). *Exp.* 34 mill.

(2) RHYNCHINA EQUALISELLA, Wlk. xxvii. 199 (1863).
,, *cæsa*, Dist. A.M.N.H. (7) i. p. 231 (1898).
Hab. **Transvaal,** Pretoria (Distant); **Natal,** Estcourt (Hutchinson); **Cape Colony,** Knysna (Trimen). *Exp.* 28 mill.

(3) RHYNCHINA POLIOPERA, n. sp.

Head and thorax fuscous brown mixed with grey; abdomen grey irrorated with brown. Forewing pale brown suffused with grey and irrorated with a few raised black scales; an indistinct waved brown antemedial line; a small black spot in middle of cell; a diffused grey fascia from apex to lower angle of cell with short black streak on it above vein 7 and longer streaks beyond it above veins 6 and 5;

the postmedial line very indistinct on costal half, strongly bent outwards below costa, excurved to vein 4, then obliquely incurved to inner margin and with some black points on its outer edge; the veins streaked with black towards termen; the cilia intersected with white; a small black mark above tornus. Under side fuscous brown.

Hab. **Cape Colony,** Annshaw (Miss F. Barrett). *Exp.* 32 mill. Type in B.M.

Sect. II. (*Rhynchina*). Antennæ of male ciliated.

A. Forewing cupreous brown, the base and inner area grey .. .. *tinctalis.*
B. Forewing grey suffused in places with cupreous .. .. *revolutalis.*

(4) Rhynchina tinctalis, Zell. Vet. Akad. Handl. 1852, p. 9 (1854).
Hypena echionalis, Wlk. xvi. 230 (1858).
Hab. **West Africa,** Sierra Leone; **Mashonaland,** Salisbury (Marshall); **Natal,** Estcourt (Hutchinson). *Exp.* 24–28 mill.

(5) Rhynchina revolutalis, Zell. Vet. Akad. Handl. 1852, p. 10 (1854).
Hab. **West Africa,** Accra; **British East Africa,** Tanga, Gwellil, Nairowa, Kikuyu; **Natal,** Victoria District (Gooch). *Exp.* 22 mill.

Genus RHÆSENA.

	Type.
Rhæsena, Wlk. xxxv. 1973 (1866)	*subcupralis.*
Symplusia, Holl. Psyche, vii. p. 28 (1894)	*subcupralis.*

A. Forewing with the fovea on under side and ridges of scales round it elongate.
a. Forewing rufous, the subterminal line irregular and distinctly angled at vein 5.. .. .. *subcupralis.*
b. Forewing darker, the subterminal line almost straight.. .. *prunescens.*
B. Forewing with the fovea on under side and ridges of scales round it short .. .. *capensis.*

(1) Rhæsena subcupralis, Wlk. xxxiv. 1167 (1865).
,, *transcissa*, Wlk. xxxv. 1974 (1866).
,, *obliquifasciata*, Moore, Lep. Atk. p. 183 (1888).
Symplusia frequens, Holl. Psyche, vii. p. 28 (1894).
Hab. **West Africa,** Ogové River; **Sokotra; British Central Africa,** Lake Nyasa; **Mashonaland,** Salisbury (Marshall); **Natal,** Durban (Gueinzius, Innes); **India; Western Australia.** *Exp.* 24–30 mill.

(2) Rhæsena prunescens, n. sp.

♂. Head, tegulæ, and forelegs yellow mixed with rufous; thorax and abdomen purplish fuscous. Forewing purplish grey irrorated with brown; the antemedial line white defined by cupreous brown on inner side and slightly angled on median nervure; a very oblique medial whitish line with cupreous suffusion before it; a whitish discoidal line with cupreous on its inner side; an almost straight white subterminal line with cupreous suffusion before it; the costa cupreous towards apex and with four white points; the termen tinged with cupreous; the fovea on under side elongate. Hindwing fuscous brown.

Hab. **Natal.** *Exp.* 24 mill. Type in B.M.

(3) Rhæsena capensis, Wlk. Trans. Ent. Soc. (3) i. p. 110 (1862).
Sarmatia divisalis, Wlk. xxxiv. 1131 (1865).
Hab. **Cape Colony** (Dr. Smith). *Exp.* 28 mill.

Genus NAARDA.

Type.
Naarda, Wlk. xxxv. 1694 (1866)... ... ... *ineffectalis*.

A. Forewing with the discoidal spot white.. .. .. *leucopis*.
B. Forewing with the discoidal point black with yellow ring .. *xanthopis*.
C. Forewing with the discoidal spot black .. .. *melanomma*.

(1) Naarda leucopis, n. sp.

♂. Head and thorax deep black; abdomen fuscous black. Forewing silky black; a whitish spot in middle of cell and a discoidal spot; very indistinct waved black antemedial, medial, and postmedial lines. Hindwing fuscous black; the under side with discoidal spot and curved postmedial and subterminal lines.

Hab. **Cape Colony,** Transkei (Miss F. Barrett). *Exp.* 26 mill. Type in B.M.

(2) Naarda xanthopis, n. sp.

♂. Fuscous black; antennæ whitish. Forewing with traces of waved antemedial and medial lines; a yellow discoidal spot with black centre; the postmedial line oblique from costa to vein 4, then incurved; an indistinct waved subterminal line; a terminal series of black points. Under side of hindwing with discoidal point and indistinct curved postmedial and subterminal lines.

♀. Antennæ black; hindwing paler with indistinct discoidal spot and curved postmedial and subterminal lines on upper side.

Hab. **Natal,** Karkloof (Marshall); **Cape Colony,** Heald Town (Miss F. Barrett). *Exp.* 18–22 mill.

(3) Naarda melanomma, n. sp.

♂. Grey-brown; palpi blackish at sides; legs and abdomen irrorated with black, the fore tibiæ black above. Forewing irrorated with black; rather ill-defined waved black subbasal, antemedial, postmedial, and subterminal lines, the postmedial angled outwards below costa, incurved in discal fold and below vein 4 retracted to below end of cell; a terminal series of black points. Hindwing suffused with fuscous; an indistinct discoidal spot and waved postmedial and subterminal lines; a terminal series of black points.

Hab. **Cape Colony,** Transkei (Miss F. Barrett). *Exp.* 28 mill. Type in B.M.

Genus LEIORHYNX, nov.

Proboscis aborted, minute; palpi downcurved extending about twice the length of head and rather smoothly scaled; frons with tuft of hair; antennæ of male bipectinate with short branches; thorax and abdomen without crests. Forewing with the apex slightly produced; veins 3 and 5 from near angle of cell; 6 from upper angle; 9 from 10 anastomosing with 8 to form the areole; 11 from cell. Hindwing with veins 3, 4 from angle of cell; 5 fully developed parallel to 4; 6, 7 from upper angle; 8 anastomosing with the cell to middle.

Leiorhynx argentifascia, n. sp.

♂. Head, thorax, and abdomen brownish ochreous irrorated with fuscous. Forewing with the costal half pale yellow-brown, the inner half pale ochreous irrorated with purplish fuscous, the two areas separated by a silvery white line curved up to termen below apex; a silvery white fascia through the cell then curved up to termen below apex and narrowing at base and extremity; cilia pale ochreous irrorated with fuscous. Hindwing yellowish white.

Hab. **N'Gamiland** (Lugard). *Exp.* 32 mill. Type in B.M.

Genus NODARIA.

Type.

Nodaria, Guen. Delt. and Pyr. p. 63 (1854) *externalis.*

Sect. I. Antennæ of male strongly dilated at middle.

A. Forewing with the subterminal line incurved .. .. *perarcuata.*
B. Forewing with the subterminal line waved .. .. *externalis.*

(1) NODARIA PERARCUATA, n. sp.

Pale ochreous thickly irrorated with fuscous. Forewing with indistinct antemedial line obtusely angled on median nervure; a diffused discoidal lunule; an indistinct minutely waved postmedial line bent outwards between veins 7 and 4, then incurved; a white subterminal line slightly angled at vein 7 then incurved and with fuscous suffusion on its inner side bent outwards across it to apex. Hindwing with whitish subterminal line with fuscous suffusion on its inner side, oblique from costa to vein 1 near termen where it is angled; the under side with discoidal point and waved postmedial and subterminal lines.

Hab. **British East Africa,** Muthambi (Crawshay); **Natal,** Victoria District (Gooch); **Cape Colony,** Transkei (Miss F. Barrett). *Exp.* 28 mill. Type in B.M.

(2) NODARIA EXTERNALIS, Guen. Delt. and Pyr. p. 64 (1852).
Herminia brachialis, Zell. Vet. Akad. Handl. 1852, p. 14 (1854).
Bocana æsopusalis, Wlk. xvi. 185 (1858).
Diomea bryophiloides, Butl. A.M.N.H. (4) xvii. p. 408 (1867).
Hab. **British East Africa,** Teita; **Nyasaland,** Chiromo; **Natal,** Durban (Gooch, Bowker, Leigh); **Cape Colony,** (Dr. Smith); **Rodriguez**; **Japan**; **Formosa**; **India, Ceylon,** and **Burma**; **Borneo**; **Australia**; **Solomons.** *Exp.* 26–30 mill.

Sect. II. Antennæ of male minutely serrate and with long bristles.

A. Forewing with the subterminal line waved.
  a. Hindwing whitish .. .. *melaleuca.*
  b. Hindwing fuscous .. .. *luctuosa.*
B. Forewing with the subterminal line incurved .. .. *extinctalis.*

(3) NODARIA MELALEUCA, n. sp.

Head and thorax silky black-brown; abdomen greyish fuscous. Forewing black-brown suffused with glossy purplish grey; a dark waved antemedial line slightly bent outwards in cell; a diffused medial line with the blackish discoidal spot on it; a waved postmedial line angled inwards in discal fold, incurved below vein 4, then angled outwards on vein 1; a diffused sinuous subterminal line. Hindwing white with fuscous subterminal line angled outwards at vein 2; a fine terminal line; cilia fuscous; under side suffused with fuscous, a dark discoidal point and curved postmedial and subterminal lines.

Hab. **Natal,** Karkloof (Marshall); **Cape Colony,** Transkei (Miss F. Barrett). *Exp.* 24 mill. Type in B.M.

(4) Nodaria luctuosa, n. sp.

Head, thorax, and abdomen fuscous brown, the last with greyish segmental lines. Forewing grey-brown irrorated and suffused with fuscous; the antemedial line angled outwards below costa and cell and inwards in cell; a diffused medial line with the dark discoidal spot on it; a waved postmedial line angled outwards below costa, inwards in discal fold, incurved below vein 4 then bent outwards at vein 1; a sinuous whitish subterminal line with diffused fuscous on its inner side. Hindwing fuscous brown with whitish subterminal line with diffused fuscous on its inner side and angled at vein 2; the under side paler with dark discoidal lunule and curved postmedial and subterminal lines.

Hab. **Natal,** Pietermaritzburg (Bowker); **Cape Colony,** Annshaw (Miss F. Barrett). *Exp.* 24 mill. Type in B.M.

(5) Nodaria extinctalis, Zell. Vet. Akad. Handl. 1852, p. 13 (1854).
,, *capalis*, Wlk. xvi. 95 (1858).
Libisosa telamusalis, Wlk. xvi. 248 (1858).
Zanclognatha caffraria, Möschl. Verh. Zool. bot. Ges. Wien. xxxiii. p. 307, pl. xvi. f. 22 (1883).
Hab. **West Africa,** Sierra Leone; **Sokotra**; **British East Africa,** Tana River, Machakos; **Natal,** Durban (Leigh); **Cape Colony** (Dr. Smith). *Exp.* 24–28 mill.

Genus HYDRILLODES.

	Type.
Hydrillodes, Guen. Delt. and Pyr. p. 65 (1854)...	*lentalis.*
Olybama, Wlk. xvi. 211 (1858	*uliginosalis.*

Antennæ of male with long cilia and bristles; fore tibia with sheath containing tufts of hair not covering the tarsus.

Hydrillodes uliginosalis, Guen. Delt. and Pyr. p. 66 (1854).
Olybama thelphusalis, Wlk. xvi. 211 (1858).
Gizama cleobisalis, Wlk. xvi. 249 (1858).
Hab. **Cape Colony** (Dr. Smith). *Exp.* 22–30 mill.

Genus ALELIMMA.

	Type.
Alelimma, Hmpsn. Moths Ind. iii. p. 47 (1895)	*pallidifusca.*

ALELIMMA PALLICOSTALIS, n. sp.

♂. Antennæ of male with bristles and cilia, the shaft dilated at middle and with tuft of long hair above; fore coxæ with tuft of long hair in a fold, the tibia with sheath covering half the tarsus and enclosing a tuft of long hair.

Dull reddish brown. Forewing with the costal area greyish; a black point at base; a much-interrupted black antemedial line bent outwards below costa and in and below cell, then oblique; a black discoidal spot; a punctiform postmedial line excurved at middle; a pale subterminal line incurved from apex to tornus; a terminal series of black points. Hindwing with indistinct dark subterminal line angled outwards to termen at vein 2; a terminal series of black points; the under side with discoidal lunule and curved postmedial and subterminal lines.

Hab. **Natal,** Victoria District (Gooch). *Exp.* 36 mill. Type in B.M.

GENUS TETRACME, nov.

Proboscis fully developed; palpi porrect extending about three times length of head, the second joint fringed with hair above, the third upturned naked; antennæ of female ciliated. Forewing with the apex produced and acute, the termen strongly angled at middle; veins 3 and 5 from near angle of cell; 6 from below angle; 7 from angle; 8, 9 stalked; 10, 11 from cell. Hindwing with veins 3, 4 from angle of cell; 5 from above angle parallel to 4; 6, 7 from upper angle; the termen slightly produced at apex and sharply angled at vein 4, then waved.

TETRACME TRUNCATARIA, Wlk. xxiii. 847 (1861).

Hab. **Natal,** Karkloof (Marshall); **Cape Colony** (Dr. Smith), Annshaw (Miss F. Barrett). *Exp.* 18–22 mill.

HYBLÆINÆ.

GENUS HYBLÆA.

	Type.
Hyblæa, Fabr. Ent. Syst. iii. 2, p. 127 (1794) ...	*puera.*

HYBLÆA PUERA, Cram. Pap. Exot. pl. 103 D, E.

Hab. **British East Africa**; **N'Gamiland** (Lugard); **Delagoa Bay** (Mrs. Monteiro); **Cape Colony** (Dr. Smith); **Madagascar**; **Aden**; **Japan**; **China**; **India, Ceylon,** and **Burma**; **Loochoo**; **Java**; **North Guinea**; **Queensland**; **West Indies**; **South America.** *Exp.* 32–40 mill

GENERA AUCTORUM.

Bithra spilosomoides, Wlk. xxxii. 621 (1865). Type lost	South Africa.
Chalestra podaresalis, Wlk. xix. 853 (1859) Type lost...	Cape Colony.
Galapha anguliplaga, Wlk. xv. 1851 (1858). Type lost...	Natal.
Phanaspa dilatalis, Wlk. xxxiv. 1193 (1865). Type lost...	South Africa.

SUPPLEMENT.

(1*a*) Timora disticta, n. sp.

♂. Head and front part of thorax bright pink; palpi, frons, and hinder half of thorax ochreous; pectus and legs whitish, the latter striped with pink above; abdomen ochreous. Forewing pale ochreous; the costal area, extending to middle of cell, bright pink, leaving the costa ochreous; a diffused orange-yellow fascia below the cell from base to middle of wings, the inner margin orange-yellow; a pink fascia on vein 1 from before middle to termen, the area above it and the cell slightly suffused with fuscous; white points at middle of cell and on discocellulars; the veins beyond the cell slightly streaked with white; cilia bright pink. Hindwing white.

Hab. **Basutoland,** Masite (Weigall). *Exp.* 34 mill. Type in B.M.

(3) Aspidifrontia atavistis, n. sp.

Proboscis fully developed; frons with roughened prominence.

♂. Head and thorax clothed with pale and dark brown, black and white scales; tegulæ with black medial line; abdomen brownish ochreous, whitish at base. Forewing pale and dark brown; the costal area ochreous irrorated with some dark scales to beyond middle, the subcostal veins streaked with white; the inner area to submedian fold ochreous leaving vein 1 dark and defined by pinkish and white scales and a dark streak on inner margin except at base; claviform a narrow elongate black-defined streak from base; orbicular small diamond-shaped, ochreous defined by black; reniform with its upper part ochreous, its lower whitish and angled inwards on median nervure to origin of vein 2; the interspaces beyond the cell slightly streaked with black; an ochreous subterminal mark above and below vein 6 and a V-shaped mark between veins 3, 4; the extremity of veins streaked with white; a terminal series of black points. Hindwing ochreous white, the veins tinged with brown, diffused towards termen; a terminal series of small blackish lunules.

Hab. **Cape Colony,** Transkei (Miss F. Barrett). *Exp.* 34 mill. Type in B.M.

(2*a*) Heliophobus ferrogrisea, n. sp.

♂. Head, thorax, and abdomen grey mixed with fuscous black. Forewing grey irrorated with black and tinged with ferruginous red; very indistinct waved grey antemedial, postmedial, and subterminal lines; a small dark discoidal annulus. Hindwing grey irrorated and suffused with fuscous; the under side paler, the costal and terminal areas strongly irrorated with fuscous, a dark discoidal point.

Hab. **Basutoland,** Masite (Weigall). *Exp.* 28 mill. Type in B.M.

(3*a*) Charidea cæca, n. sp.

♂. Head and thorax grey-brown mixed with black; tegulæ darker, some of the scales tipped with white; abdomen grey-brown irrorated with dark brown. Forewing grey, thickly irrorated with dark brown; a black subbasal line from costa to submedian fold; the antemedial line with small triangular spot on costa, bent inwards from below costa to vein 1; claviform large, deep black; orbicular and reniform deep black, the former produced to a slight point on inner side; the postmedial line minutely waved, with small triangular spot at costa bent outwards below costa, excurved to vein 4, then incurved and angled outwards at vein 1, the area from just beyond it to subterminal line suffused with fuscous, the line indistinct greyish, angled outwards at vein 7 and excurved at middle; some pale points on costa towards apex; a black terminal line. Hindwing pale brown with an ochreous tinge; the under side ochreous white, the costal and terminal areas suffused with brown and irrorated with grey, a slight discoidal spot and curved postmedial line.

Hab. **Natal,** Charleston. *Exp.* 34 mill. Type in B.M.

Allied to *C. leucopis*, the male of which will probably be found to have similar antennæ.

(2*a*) Sesamia rubritincta, n. sp.

♂. Head and thorax ochreous suffused with purple-red, the vertex of head and tegulæ, except at base, without red; antennæ, tibiæ, and tarsi fulvous; abdomen ochreous suffused with purple-red. Forewing ochreous whitish; the veins and interspaces with diffused red streaks except on basal two-thirds of costal area and the inner area, the red becoming purplish pink on medial part of terminal area and the veins of that part dark brown; a highly curved minutely dentate antemedial red line; a whitish discoidal point; a dentate postmedial line excurved below costa, then oblique; a diffused blackish subterminal band from below apex to above vein 2; an interrupted dark terminal line. Hindwing ochreous white, the inner

margin and cilia slightly tinged with purple-red; the under side with traces of a curved postmedial line on costal area.

Hab. **Basutoland,** Maseru (Wroughton). *Exp.* 46 mill. Type in B.M.

(2*a*) Caradrina leucopis, n. sp.

Head and thorax black-brown; abdomen fuscous. Forewing black-brown slightly irrorated with grey; an indistinct short subbasal line from costa defined by pale brownish on inner side; a waved antemedial line interrupted at cell and vein 1 and defined by pale brownish on inner side; orbicular small, black, elliptical; reniform a small black lunule with prominent white spot on its outer edge; a faint waved oblique line from lower angle of cell to inner margin; a somewhat dentate postmedial line slightly defined by brownish on outer side, bent outwards below costa, excurved to vein 4, then incurved and angled outwards again at vein 1; a pale brownish subterminal line defined by diffused black on inner side, angled outwards at vein 7, excurved at middle and again towards tornus; a terminal series of small black spots. Hindwing pale fuscous; the under side white except towards costa and termen, a small discoidal spot.

Hab. **Basutoland,** Machacha, 10,000 (Crawshay). *Exp.* 30–34 mill. Type in B.M.

(17*a*) Caradrina glaucistis, n. sp.

♂. White; palpi black at sides except at tips; thorax with a few black scales; legs with some black, the tarsi banded with black; abdomen with slight fuscous bands. Forewing slightly irrorated with fuscous, the basal and terminal areas suffused with fuscous; an oblique black antemedial line angled outwards below costa and in submedian fold and excurved above inner margin; a diffused oblique medial line strongly angled outwards to lower angle of cell; a slight black discoidal lunule; the postmedial line dentate, bent outwards below costa, angled inwards in discal fold, strongly incurved in submedian fold, then angled outwards on vein 1; the subterminal line defined by diffused fuscous on its inner side, angled outwards at vein 7 and excurved at middle; a terminal series of black points. Hindwing semihyaline white, the terminal area tinged with fuscous; the under side with discoidal point and postmedial and terminal series.

Hab. **Basutoland,** Maseru (Crawshay). *Exp.* 28 mill. Type in B.M.

(2*a*) Eutelia inextricata, Moore, Lep. Atk. p. 147 (1882).
Hab. **Basutoland,** Maseru (Crawshay); **China; India; Ceylon.**
Exp. 32–40 mill.

(13) Eutelia albiapicata, n. sp.

♀. Head and thorax olive-green mixed with black; abdomen greyish mixed with red, the dorsal crests black with pale oblique marks on each side of them. Forewing with olive-green and brown shades, the basal area suffused with leaden scales extending on costal area to middle of wing; a double black antemedial line excurved from costa to median nervure, then incurved; a brownish white discoidal patch extending to costa and including the reniform which is slightly outlined with fuscous and with a blackish line from it to inner margin angled outwards above vein 1; a double postmedial line, oblique from costa to vein 6, then incurved to vein 2 and excurved above vein 1, and with two less distinct lines beyond it, an oblique black streak on the inner line from vein 8 continued to middle of termen; apical area greenish, with white patch at apex, the veins streaked with black and a small black subterminal spot above vein 6; a crenulate black subterminal line. Hindwing fuscous brown with slight pale marks on inner margin and termen towards tornus; a crenulate black terminal line; cilia rufous; the under side whitish irrorated with brown and the terminal area suffused with purple-red, a small black discoidal spot, a waved postmedial line and three on terminal area.

Hab. **Natal,** Durban (Leigh). *Exp.* 26 mill. Type in B.M.

Genus PARDASENA.

	Type.
Pardasena, Wlk. xxxv. 1730 (1866)	*ræselioides.*

Differs from *Blenina* in the hindwing having vein 4 absent.

Sect. I. Hindwing with veins 3, 5 shortly stalked.

(1) Pardasena punctata, n. sp.

♀. Grey-white; palpi marked with black above; vertex of head and patagia with black points; legs irrorated with black. Forewing with black point at base of costa and curved subbasal punctiform black line from costa to subcostal nervure; obliquely placed black antemedial points on vein 1 and above inner margin, a point on middle of inner margin; a discoidal point; the postmedial line represented by a series of black points strongly bent outwards below

costa, excurved to vein 4, then oblique; the subterminal line somewhat diffused, fuscous, excurved below costa and at middle and angled inwards in discal fold; a terminal series of black points. Hindwing white tinged with fuscous.

Hab. **Natal,** Durban (Leigh). *Exp.* 20 mill. Type in B.M.

Sect. II. Hindwing with veins 3, 5 from cell.

(2) Pardasena virgulana, Mab. Bull. Soc. Ent. Belge, 1880, p. xvii.

Hab. **British East Africa,** Sabaki River, Nzoai, Eb. Urru; **Natal,** Durban (Leigh); **Madagascar.** *Exp.* 18–22 mill.

(5) Acripia semiviridis, n. sp.

♀. Head and thorax olive-green; pectus and legs white irrorated with brown; tarsi banded black and white; abdomen purplish fuscous, pale brownish below. Forewing olive-green with numerous fine pale striæ; some slight black points on costa towards apex and some subterminal points; cilia purplish brown at tips. Hindwing purplish brown; the under side pale brown striated with black and with black discoidal spot.

Hab. **Natal,** Durban (Leigh). *Exp.* 26 mill. Type in B.M.

(6) Acripia poliotis, n. sp.

♂. Head and thorax yellow-brown suffused with grey and irrorated with a few black scales; abdomen brownish ochreous. Forewing yellow-brown suffused with white especially on basal and costal area and irrorated with a few black scales; the apex slightly produced and the termen slightly excurved at middle; a slight subbasal line from costa to submedian fold; an oblique waved brown antemedial line; a white discoidal lunule with two black points on it; a minutely dentate postmedial line, excurved below costa and at median nervules, then incurved; an indistinct somewhat dentate subterminal line slightly excurved below costa and at middle; a terminal series of black points on white spots. Hindwing ochreous brown; the under side grey-brown irrorated with black on costal area and from lower angle of cell to termen, a black discoidal point and oblique postmedial line, a terminal series of small black lunules.

♀. Abdomen and hindwing suffused with fuscous.

Hab. **Natal,** Durban (Leigh); **Cape Colony,** Grahamstown (Schönland). *Exp.* 36–38 mill. Type in B.M.

(3) Westermannia luminosa, Wlk. xv. (1859).

Thalpochares parectata, Wllgrn. Wien. Ent. Mon. vii. p. 148 (1863).

Hab. **Congo**; **Abyssinia**; **British East Africa**, Tana River; **N'Gamiland**; **Matabeleland** (Oates). *Exp.* 24 mill.

(4) Westermannia ruficeps, n. sp.

♂. Head rufous; thorax pure white; legs tinged with yellow; abdomen brownish white, the anal tuft and extremity tinged with ochreous. Forewing white; the costal area suffused with pale olive-green; an olive-green band from discal fold in end of cell to inner margin, and a patch beyond the cell before the indistinct postmedial line formed of dark points, excurved below costa, oblique to vein 4, then incurved; the terminal area thickly irrorated with rufous and with diffused rufous patches at middle and above inner margin; the extreme apex yellowish. Hindwing yellowish white tinged with brown towards termen.

Hab. **Natal**, Durban (Leigh). *Exp.* 24 mill. Type in B.M.

(27*a*) Ophiusa violascens, n. sp.

♀. Head, tegulæ, and patagia lilacine grey irrorated with a few brown scales; abdomen pale brownish, the ventral surface white irrorated with dark brown. Forewing lilacine grey irrorated with black and suffused with rufous towards the subterminal line; an oblique waved pale rufous antemedial line defined by white on outer side; orbicular and reniform defined by rufous, the former a minute annulus, the latter constricted at middle; the postmedial line rufous defined by white on inner side, excurved below costa and at middle, angled inwards in discal and submedian folds; subterminal line whitish defined by diffused dark rufous on inner side and brownish on outer, incurved below costa, angled outwards at vein 7, then incurved and ending at tornus; the terminal area greyer with highly crenulate rufous terminal line; cilia blackish except at apex and tornus. Hindwing ochreous brown the terminal half suffused with fuscous; cilia white, brown at middle; the under side white irrorated with brown, the terminal half suffused with brown.

Hab. **Natal**, Durban (Leigh). *Exp.* 46 mill. Type in B.M.

XIV.—*South African Hydrachnids* (First Paper).—By Sig Thor, *Christiania, Norway.*

(Plates XVI.–XXI.)

The study of the Water-mites (*Hydrachnidæ*) of South Africa had been completely neglected until Dr. W. F. Purcell, six years ago, collected some specimens, which Professor G. O. Sars handed over to me for determination, viz.: 1. *Diplodontus despiciens* (Müller, 1776), 2. *Limnesia undulata?* (Müller, 1776), and 3. a new genus and species, *Capobates sarsi* Sig Thor, 1898 (26, 27).*

During the last few years Mr. Purcell and Mr. R. M. Lightfoot collected a large number of *Hydrachnids*, especially from the brack and fresh-water ponds of the Cape Peninsula, and they have sent me the specimens for examination, the first results of which are embodied in this paper.

I have in all determined 16 species. Of these 10 are new to science, 3 are well-known cosmopolitan species, while 1 was previously described by me (27) from the Cape Flats, and 2 by Dr. F. Koenike (20, 21, 22, 23) from East Africa and Madagascar.

Some nymphs could not be identified with certainty, and are, therefore, not recorded in this paper.

I. Family **EULAÏDÆ** Kramer, 1877 (13).

I. Gen. EULAIS Latreille, 1796 (3).

1. Eulaïs purcelli n. sp.

Plates XVI., XVII., figs. 1–4.

Length of body about 3–4 mm.
Width ,, ,, 2·5–3·5 mm.

* The numbers in brackets after authors' names refer to the List of Literature at the end of the paper.

Length of maxillary palps about 1·4 mm.
,, leg I about 2 mm.
,, ,, II ,, 2·6 mm.
,, ,, III ,, 2·8 mm.
,, ,, IV ,, 3 mm.

This mite is one of the largest species of the genus, and is closely related to *Eulaïs megalostoma* Koenike, 1897 (22, 23), and *Eulaïs georgei* Soar, 1901 (34), from which it differs especially in the shape of the eye-plate, the maxillary palps, and the air-sacks.

The real *colour* is unknown to me, being probably red, like that of most *Eulaïs*-species, but decolorised by the alcohol.

The *shape* does not differ from the usual *Eulaïs*-form, being flat and broadly ovoid.

The *legs* are rather short; the fourth pair is nearly as long as the body and without swimming hairs; the first pair is much thickened, and possesses only a few swimming hairs. The *claws* exhibit the usual appearance and are *bifid*, the ventral tip being short and stout.

Eyes.—The shape of the *eye-plates* places this mite in the group of *E. megalostoma* Koen., and *E. georgei* Soar. *E. purcelli* n. sp., however, differs very distinctly from both these species. The eye-plate of each side (containing each two eyes) is short (0·2 mm.), but the whole expanse of the eye-plates, measured from side to side, is 0·5 mm., for the length of the *eye-bridge* connecting the plates alone amounts to 0·18 mm. This long eye-bridge is curved backwards (fig. 1). The large *hair-pores* (fig. 1, *h*) are situated nearer to the ends of the bridge than in *E. georgei* Soar—much as in *E. megalostoma* Koen.; but *E. purcelli* n. sp., does *not* possess the four lens-like tubercles (*cf.*, *E. megalostoma* Koenike (23), Plate XX., fig. 1, r^1, r^2). The *eye-lenses* have the usual form.

Maxillary Organs.—The *maxillary plate* (fig. 2) is very like that of *E. megalostoma* Koen., with extremely *large mouth-opening* and large oral fringe ("Mundsaum") (fig. 2, *k*). The large, anterior, lateral process (fig. 2, *pf*) is still larger than in *E. megalostoma* Koen., and directed more backwards.

The *pharynx* is very thick, while the *air-sacks* are thinner and shorter, with their hind ends but little curved (fig. 2, *ls*).

The *mandibles* (fig. 3) show no very remarkable differences from those of the two species mentioned above; the posterior inner process (fig. 3, *st*), however, is thicker and the inner side more irregular.

The *maxillary palps* (figured from the outer side in fig. 4) furnish

the best characters for distinguishing this species from *E. megalostoma* Koen., and *E. georgei* Soar. The palps of *E. purcelli* are long and thin, whereas those of *E. megalostoma* Koen., are short and thick, this difference being most pronounced in the fourth and fifth segments. The fifth (last) segment is very long and almost cylindrical, and is narrow in the middle; its distal end is not so pointed, but is furnished with a greater number of small spines or bristles, the segment possessing altogether about 24–30 spines. The comparative lengths of the five segments may be seen from the following measurements (in order from the first to the fifth segment): about 0·17 + 0·23 + 0·26 + 0·50 + 0·32 mm. The third segment has only a *small*, inner, distal dilatation with 7 small spines. The fourth segment possesses on the outer side (fig. 4) 8 spines and 2 feathered ones at the distal end, while on the inner side are about 20 spines, viz. 10 in a row and 10 others, partly feathered.

The *epimera* and the *genital area* (opening and hairs) are like those of most of the species of the genus.

Locality.—Mr. Purcell and Mr. Lightfoot collected 5 ex. (S. A. Mus. Reg. No. 9033) in fresh-water ponds near Retreat Vlei, Cape Flats, together with four other species (Oct., 1900).

2. Eulaïs lightfooti n. sp.

Plates XVI., XVII., figs. 5–8.

Length of body about 3–4 mm.
Width ,, ,, 2·5–3·5 mm.
Length of maxillary palps 1·1 mm.

This mite may be referred to the group of *Eulaïs mülleri* Koenike, 1897 (22), but it is very different from all the species known to me. It is as large as *E. purcelli* n. sp.

The *colour*, *shape*, *epimera* and *legs* do not differ much from *E. purcelli* n. sp.

Eyes.—The *eye-plates* (fig. 5) are very regular, the *eye-bridge* being almost uniformly semicircular, emarginated in the anterior and in the posterior border and provided in the former with a small process directed forwards (fig. 5, *p*). The *hair-pores* (fig. 5, *h*) are small and situated far towards the sides in the punctuated capsules.

Maxillary Organs.—The *maxillary plate* (fig. 6) is short, with the ends of the posterior lateral processes (fig. 6, *pp*) much broadened. The *mouth-opening* is as large as in *E. megalostoma* Koen., and *E. purcelli* n. sp., and has a large oral fringe. The *pharynx* is short but capacious.

The *mandibles* (fig. 7) are relatively narrow, with obtuse, inner, basal process (fig. 7, *st*).

The *maxillary palps* furnish us here also with a good character for distinguishing the species. The structure is, on the whole, quite normal. The lengths of the five segments (reckoning from the first to the fifth) are: 0·15 + 0·2 + 0·2 + 0·4 + 0·2 mm. The third segment has only a small, inner, distal dilatation with 4 very short spines. The fourth segment possesses on the outer side only 3 long dagger spines in a row and 1 at the distal end near the dorsal side; on the inner side are 10 spines, viz., 3 thick dagger spines, 5 short feathered ones, and 2 long ones near the dorsal side.

The other organs do not show remarkable differences.

Locality.—Mr. Lightfoot and Mr. Purcell collected about 20 ex. in fresh-water ponds near Retreat Vlei (Oct., 1900) (Reg. No. 9034), and in brack ponds at Zeekoe Vlei, Cape Flats (March, 1900) (Reg. No. 9035).

3. Eulaïs variabilis n. sp.

Plates XVI., XVII., figs. 9–15.

Length of body about 2–3 mm.
Width ,, ,, 2–2·5 mm.
Length of maxillary palps about 0·9–1 mm.
Length of leg I about 1·6 mm.
,, ,, II ,, 2·0 mm.
,, ,, III ,, 2·1 mm.
,, ,, IV ,, 2·5 mm.

I have found many variations in this mite, and have, therefore, delineated several eye-plates. It is possible that later on one will have to distinguish two or more species, but at present I can only look upon them as varieties of one form. Several transitional forms are also met with.

The general appearance of the mite is the ordinary one, the characteristic differences lying in the form of the eye-plates and the maxillary organs. Some of its characters place it in the neighbourhood of *E. lightfooti* n. sp., and *E. degenerata* Koenike, 1897 (22, 23).

Eyes.—The typical *eye-plates* (fig. 9) resemble in shape those of *E. mülleri* Koenike, 1897 (22), and *E. dividuus* Soar, 1901 (34). The *eye-bridge* is broad, with the hind margin in almost a straight line and at right angles to the eye-capsules. The *muscle-peg* is broad, rounded, and directed forwards towards the rounded incision

of the anterior margin. On both sides are the large *hair-pores*, placed relatively near together.

In the one variety, *E. variabilis* var. *magna* nov. var. (fig. 10) the eye-bridge is still larger, with the hind margin curved, the incision of the front margin wider and the muscle-peg larger and divided.

In another variety, *E. variabilis* var. *intermedia* nov. var. (fig. 11), the eye-plates and bridge are smaller, with the muscle-peg also smaller, directed backwards and extending beyond the hind margin The hair-pores are situated more towards the sides, nearer to the eye-capsules.

Maxillary Organs.—The *maxillary plate* (fig. 12) is very peculiar, the inferior part being *coalesced* with the *pharynx* (fig. 12, *ph*), so that it is impossible to distinguish the hinder part of the maxillary plate from the pharynx. The long, posterior, maxillary processes (fig. 12, *pp*) apparently arise from the pharynx. A similar formation probably exists in *E. degenerata* Koenike, 1897 (22, 23), but the pharynx in *E. variabilis* n. sp., is thin and long. The *air-sacks* (fig. 12, *ls*) and the anterior maxillary processes (fig. 12, *pf*) are also long and robust. The *mouth-opening* is large, with a large oral fringe (fig. 12, *k*).

The *maxillary palps* (figs. 13 and 14) are very like those of *E. degenerata* Koen., with the fifth segment pointed. The spines on the small distal process of the third segment are very long, but only a few are feathered; they are 9 in number, and in addition there are 3 or 4 in the middle of the segment. The fourth segment possesses on the outer side (fig. 13) about 4 or 5 long ensiform spines besides 6 smaller ones, and on the inner side (fig. 14) about 6 ensiform spines in a row and 11–12 others, about 8 of the latter being feathered. The lengths of the 5 segments (reckoning from the first to the fifth) are: 0·10 + 0·16 + 0·18 + 0·28 + 0·18 mm.

The *epimera*, the "*anus*," and the *genital area* with the genital hairs are shown in fig. 15.

Locality.—Mr. Purcell and Mr. Lightfoot collected about 40 ex. in fresh-water ponds near Retreat Vlei, Cape Flats (Oct., 1900) (Reg. No. 9036).

4. Eulaïs voeltzkowi Koenike, 1897 (22, 23).

Locality.—Mr. Purcell collected 1 ex. in a fresh-water pond on the Maitland Flats, near Cape Town (Sept., 1899) (Reg. No. 4624), and 2 ex. near Retreat Vlei (Oct., 1900) (Reg. No. 9037).

II. Subgen. CAPEULAÏS nov. subgen.

The hinder portion of the body is thickened or vesicularly enlarged in the ventral part, the thickened part being provided with a longish depression below along the middle. Seen from the dorsal side the body appears obovate (different from *Eulaïs* Latreille [3]), becoming narrower posteriorly, the posterior surface of the narrower part sloping downwards until it forms part of the ventral enlargement.

Very characteristic for this subgenus is the shape of the palps and of the fourth pair of legs. Both the palps and the fourth pair of legs are greatly thickened in a different manner to those in *Eulaïs* Latr. The palps are very short and thick and possess but few of the ordinary spines; but, on the other hand, there are *two* exceedingly thick and strong spines near the distal end on the outer side (on the fourth and fifth segments).

It is doubtful whether *Capeulaïs* (*C. crassipalpis* n. sp.) is best regarded as a genus or as a subgenus of *Eulaïs* Latr. I consider at present the latter interpretation best, as *Capeulaïs* agrees with *Eulaïs* Latr., in regard to the skin, the eye-plates, the epimera, the genital area, and the 3 anterior pairs of legs. The fourth pair of legs agrees also in being without swimming hairs and without genital processes.

5. Capeulaïs crassipalpis n. sp.

Plate XVIII., figs. 16–22.

Length of body about 1·6–2·1 mm.
Width ,, ,, 1·3–1·5 mm.
Length of maxillary palps about 0·75 mm.
,, leg I about 1·2 mm.
,, ,, II ,, 1·8 mm.
,, ,, III ,, 2·1 mm.
,, ,, IV ,, 2·3 mm.

The general *shape* of the body has already been characterised for the genus. The *colour* cannot be seen, as the specimens are decolourised by the alcohol.

The *epimera* are relatively broad and closer together than in most species of *Eulaïs* Latr. Their shape, position and relations to the maxillary organs, genital opening and "anus" may be seen in fig. 16.

Eyes.—The *eye-plates* exhibit the form typica of *Eulaïs* Latr., having the two eye-capsules joined by a "*bridge.*" The eye-bridge has, however, an uncommon shape, and the nearest form I find to

it is that in *Eulaïs occulta* Sig Thor, 1899 (29). The eye-bridge (figs. 17 and 18) is broad, simple, without special marks, convexly projecting anteriorly, and with the posterior margin straight or curved. The *hair-pores* are not situated in the bridge but in the inner margin of each capsule (fig. 17, *h*). The muscles are attached to the inferior side of the bridge (fig. 18, *m*). The two pairs of *eye-lenses* have the same shape and situation as in *Eulaïs* Latr., the anterior ones being stalked and the posterior ones curved and ellipsoid.

Maxillary Organs.—The *maxillary plate* (fig. 16) is shaped as in most of the species of *Eulaïs* Latr., and exhibits no very remarkable characters. The shape of the *mandible* may be seen in fig. 19.

The *maxillary palps* (figs. 20 and 21) are, as already stated, extremely thick and short; the second segment is about 0·21 mm. thick, almost a third of the total length of the palp; the third segment is 0·17 mm. thick. The lengths of the 5 palpal segments (counting from the first to the fifth) are about 0·08 + 0·17 + 0·13 + 0·24 + 0·13 mm. The third segment possesses (like the second) on the inner side at the distal end 4 short thick spines, besides 4 others in the middle (fig. 20).

The *inner* side (fig. 20) of the fourth segment bears in a row only 2 longer and 3 short feathered spines, and at the distal end 3 short, broad, feathered ones. The *outer* side (fig. 21) has only 1 long ensiform and 1 extraordinarily thick and strong spine at the distal end. A similar spine exists near the proximal end of the fifth segment. The thick distal spine of the fourth segment recalls to mind the distal process in *Tiphys* Koch (7, 8), *Acercus* Koch, *Forelia* Haller, *Curvipes* Koenike (19), *Lebertia* Neuman (11), and other genera. Probably a prehensile function, like that of claws, is to be attributed to these two spines in *Capeulaïs*.

The fifth segment is not pointed at the distal end, but enlarged, and possesses here about 6 spines.

Legs.—The 3 anterior pairs of legs have the same shape as in *Eulaïs* Latr., the second and third having many, the first pair but few swimming hairs. The *fourth pair* (fig. 22) is extremely thick (the third segment being 0·33 mm. in diameter), but otherwise of the same structure as in *Eulaïs* Latr. The fourth leg is almost twice as thick as the other legs and thicker than the maxillary palps; there are no swimming hairs, and only a few small spines. The *claws* are short, but normal and bifid.

More considerable external differences between the two sexes do not occur in the species.

Localities.—Mr. Purcell and Mr. Lightfoot collected about 25 ex. in fresh-water ponds near Retreat Vlei (Oct., 1900) (Reg. No. 9038), and 2 ex. in brack ponds at Zeekoe Vlei, Cape Flats (March, 1900).

II. Family **HYDRYPHANTIDÆ** (Piersig, 1896) (24).

III. Gen. DIPLODONTUS Dugès, 1834 (6).

6. Diplodontus despiciens (Müller, 1776) (1, 2).

Locality.—This mite seems to be very common in the Cape Peninsula. Mr. Purcell collected 2 ex. in a fresh-water pond at Bergvliet Farm in the Constantia Area (May, 1896) (Reg. No. 4588), and 69 ex. in fresh-water ponds between Zeekoe Vlei and Retreat Station, Cape Flats (March, 1900) (Reg. No. 4628). Mr. Lightfoot and Mr. Purcell also collected 13 ex. in Retreat Vlei (fresh water), Cape Flats (April, 1900) (Reg. No. 4629).

III. Family **LEBERTIIDÆ** Sig Thor, 1900 (30).

IV. Gen. OXUS Kramer, 1877 (13, 14).

7. Oxus stuhlmanni (Koenike, 1895) (20).

Locality.—Mr. Purcell collected 2 ex. in fresh-water ponds between Zeekoe Vlei and Retreat Station, Cape Flats (March, 1900) (Reg. No. 4625).

IV. Family **LIMNESIIDÆ** Sig Thor, 1900 (30).

V. Gen. LIMNESIA Koch, 1835 (7).

8. Limnesia africana ♂ ♀, n. sp.
Plate XIX., figs. 23–26.

This new species is very similar in structure to *Limnesia undulata* (Müller, 1776) (2), and may easily be mistaken, at first sight, for this species. It differs, however, in several details, and is smaller than *L. undulata* (Müller).

Length of body, ♂ 0·56–0·8 mm.
Width ,, ♂ 0·4–0·6 mm.
Length ,, ♀ 0·8–1·0 mm.
Width ,, ♀ 0·7–0·8 mm.

Maxillary Organs.—The *palps* (figs. 23 and 24) are relatively short and thick. The peg on the second segment, especially the

basal part, is short. On the flexor side of the *fourth segment* are 2 (or 3) thick teeth (papillæ), like those on the palps of species of the genus *Curvipes*, whereas *L. undulata* (Müller) has only rudiments of papillæ for the insertion of the hairs. Similar palpal papillæ are found on the fourth segment of *Limnesia aspera* Koenike, 1898 (23), but the structure of the skin, of the epimeral and genital area, &c., prohibit an identification with this species. The *mandibles* and the *maxillary lip* do not show remarkable differences.

The *epimera* (fig. 25) are characterised by having the fourth epimeron very short and rounded at the hinder end. The usual pores occur in the inner end of the third and fourth epimeron.

Genital Organs.—The genital area has the typical *Limnesia* form. The ♂ (fig. 25) has the genital plates coalesced anteriorly and posteriorly. The principal characteristic is the position of the second (middle) genital disc (*acetabulum*), which in both ♂ and ♀ is very near the third posterior disc (figs. 25 and 26). Several small hair-pores also occur.

The *skin-pores* at the sides of the genital area and the "anus" have the usual shape and positions.

Locality.—Mr. Purcell collected 2 ♀ in Retreat Vlei (fresh water), Cape Flats (Oct., 1900) (Reg. No. 4630), 10 ex. (6 ♂, 4 ♀) in brack-water ponds at Zeekoe Vlei, Cape Flats, near Cape Town (March, 1900) (Reg. No. 4621), and 1 ♀ in a fresh-water pond between Zeekoe Vlei and Retreat Station (March, 1900).

V. Family **HYGROBATIDÆ** Koch, 1842 (8).

VI. Gen. CAPOBATES Sig Thor, 1898 (26, 27).

9. Capobates sarsi Sig Thor, 1898.

Locality.—Mr. Purcell collected 1 ♀ at Bergvliet Farm in the Constantia Area, near Capetown (May, 1896) (Reg. No. 4587) and a few nymphs in fresh-water ponds between Zeekoe Vlei and Retreat Station (March, 1900).

VI. Family **CURVIPEDIDÆ** Sig Thor, 1900 (30).

VII. Gen. CURVIPES Koenike, 1891 (19).

10. Curvipes coccineus ♀ (Koch), 1836; Berlese, 1882; Sig Thor, 1897 (7, 17, 25).

Locality.—Mr. Purcell collected 10 ♀ in fresh-water ponds

between Zeekoe Vlei and Retreat Station, Cape Flats (March, 1900) (Reg. No. 9039).

As no ♂ was obtained, I do not feel absolutely sure that the species is *C. coccineus* (Koch), but I have not found as yet any important differences in the ♀. The species is *new* to the fauna of Africa.

11. Curvipes tridens ♀, n. sp.

Plate XIX., figs. 27–30.

This new species is closely related to *C. coccineus* (Koch, 1836) (7), *C. stjördalensis* Sig Thor, 1897 (25), and *C. controversiosus* Piersig, 1897 (24), but it exhibits some characteristics which mark it as a new species.

Maxillary Organs.—The *palps* (fig. 27) have the typical *Curvipes* structure. The fourth segment has 3 large hair-processes or papillæ in addition to the usual chitinous process (different from *C. coccineus* (Koch) and *C. controversiosus* Piersig), and has small hair-pores at the distal end. The fifth segment terminates, as usual, with 3 small chitinous processes or claws. For the structure of the *mandibles* see fig. 28.

The *epimeral area* is congested, but of the usual structure (fig. 29).

The *genital area* (figs. 29 and 30) resembles that of the described allied species, especially *C. coccineus* Koch, and *C. stjördalensis* Sig Thor (31), in having *two pairs* of smaller *hair-pores* at the middle of the genital valves in front of the disc-plates. The latter differ from those of the 2 species just mentioned, being smaller and having a smaller number of discs (*acetabulæ*), viz., 12–15. From *C. controversiosus* Piersig, this species also differs in having the 2 pairs of small hair-pores at the middle of the genital valves.

The "*anus*" is situated near to the genital area, and is surrounded by a thick, chitinous, annular wall (fig. 30).

The *skin* is thin, with very fine lines, as in most of the species of the genus.

Locality.—Mr. Purcell collected 2 ♀ in a fresh-water pond near Retreat Vlei, Cape Flats (Oct., 1900) (Reg. No. 4633).

VII. Family **ATACIDÆ** Sig Thor, 1900 (30).

VIII. Gen. ATAX (Dugès) Bruzelius, 1854 (9).

12. Atax crassipes (Müller, 1776) (1, 2).

Locality.—Mr. Purcell collected a few nymphs in fresh-water

ponds between Zeekoe Vlei and Retreat Station, Cape Flats (March, 1900).

VIII. Family **ARRENURIDÆ** Sig Thor, 1900 (30).

IX. Gen. ARRENURUS Dugès, 1834 (6).

13. Arrenurus purcelli ♂, n. sp.

Plate XX., figs. 31–34.

Length of body 0·58 mm.
Width „ 0·48 mm.

This mite belongs to the group of *Arrenurus integrator—forpicatus* (subgen. *Micrurus*, K. Thon) (33), and is one of the smallest African species of *Arrenurus* at present known.

The *colour* is probably reddish-brown.

The *contour* of the body, seen from above (fig. 31) or from below (fig. 32), is broadly elliptical, with an incision in front and another behind. The anterior incision is shallow and rounded, while the posterior incision has a small, inner, narrower part within which a diminutive petiolus peeps out (fig. 33). At the sides of the posterior incision the margin of the body forms a pair of small angles. Five pairs of marginal hairs are attached to this hinder part of the body (fig. 33). The *dorsal side* is a little convex and very uniform, without dorsal humps. The dorsal line is also equally elliptical, curving outwards behind (fig. 31).

The *ventral side* presents no very characteristic differences. The *epimera* are of the usual size, rounded, and furnished with the usual pores. The *genital opening* is small with the usual small valves. The *pore-plates* are small, very simple, almost straight, elliptical, rounded at the ends, and provided with fine pores.

The *legs* are short but normal; the fourth pair has no process (spur) on the fourth segment.

Maxillary Organs.—The *maxillary plate* is small. The *short*, finely pored *palps* (fig. 34) are well developed, the second segment being furnished with 3 bristles. The fourth segment has a large straight spine near the flexor side and 2 small but conspicuous prehensile hairs, the inner one being bent. The fifth segment (claw) is cleft, with a small hair internally and a long one externally. I have not succeeded in dissecting the *mandibles*, the description of which will be made when more specimens are available.

Locality.—Mr. Purcell collected 1 ♂ at Bergvliet Farm, Constantia Area, near Capetown (May, 1896) (Reg. No. 4585).

14. Arrenurus capensis ♂, n. sp.

Plate XX., figs. 35–39.

Length of body (including the tail and petiolus) 1·35 mm.
Width ,, 0·80 mm.
Height ,, 0·75 mm.
Length of petiolus (seen from above) 0·14 mm.

This species belongs to the *A. emarginator* group (subgen. *Petiolurus* K. Thon, 1900) (33).

The *colour* is probably green.

The *shape* of the body, seen from above, resembles that of the ♂ of *A. maculator* (Müller), Koenike; it is longish, emarginated at the front and at the anterior outer margins on the outer sides of the eyes, but the upper side has not the large dorsal humps. The humps have contours conforming more to those of the ♂ of *A. emarginator* (Müller), Neuman (11) but are smaller. The hind lateral angles are very small and project but little laterally and backwards (fig. 36), the hind ends reach scarcely further backwards than the sinuous posterior margin, where the usual *hairs*, the *petiolus*, and the *hyaline membrane* are found. The inner curved hairs reach over the hind end of the petiolus, which, seen from above, tapers backwards and is longish, rounded, and without angles. Near the hind end an upright process apparently stood (fig. 37), but this probably was an artificial product and not chitinised, for I removed it without injuring the petiolus. Seen from the side (figs. 35 and 37) the petiolus appears obliquely truncated. The hyaline membrane is narrow, with sharp hind angles. Near the posterior margin of the tail are 2 small hair-bearing protuberances, and between these a small process (fig. 36). The dorsal humps are also very small, both the pair behind the eyes and the pair over the commencement of the tail inside of the dorsal line (*incisura dorsalis*); the humps are very remote from one another and smaller than in the allied species. Seen from the side, these humps appear rounded, without peaks (fig. 35). The anterior protuberances, external to the anterior end of the dorsal line, are also rounded and are scarcely visible from the side. The dorsal line may be compared to half a shoe-sole; it is bent outwards at the hind angles.

The *under side* shows no very remarkable characteristics in regard to the *epimera*, which are partly incrusted in the only specimen. The first epimera have long, pointed, anterior prolongations. The *maxillary* sinus is small and contains a little maxillary plate. I have not dissected the mandibles.

The *maxillary palps* (figs. 38 and 39) have the extensor side of the fourth segment provided with a saddle-like emargination, analogous to that found in *A. frustrator* Koenike, 1898 (23), but the emargination is not so deep as in the latter species. The prehensile spine (fig. 38, *sp*) is straight, very long, and situated far inwards from the distal flexor corner of the fourth segment. The fifth segment (claw) (fig. 38, *cl*) is large, cleft, and provided with a long hair in the middle on the flexor side. The hairs on the antagonistic portion of the fourth segment are inconspicuous.

The *legs* are normal, the fourth pair having on the fourth segment a large process or spur with 8 hairs at the apex (fig. 35, *pr*).

The *genital pore-plates* are narrow, like, for instance, those of the ♂ of *A. bicuspidator* Berlese (17), but shorter; the outer ends are curved forwards.

Locality.—Mr. Purcell collected 1 ♂ in a brack-water pond at Zeekoe Vlei, Cape Flats (March, 1900), together with 2 *Arrenurus* females of other species.

15. Arrenurus meridionalis ♀, n. sp.

Plate XXI., figs. 40–42.

The only female specimen of this mite was found together with the ♂ of *A. capensis* n. sp., described above, and at first I felt inclined to regard it as the female of that species. The ♀ specimen reminds one also of the females of related species, for instance, *A. bicuspidator* Berlese, *A. tricuspidator* (Müller), *A. claviger* Koenike, &c. The large size of this ♀, however, as compared with the ♂ of *A. capensis*, the rounding of the frontal margin, the shape of the genital plates and of the palps, &c., go against their identification. Besides, with these 2 mites another ♀ was found which distinctly differs from all of them. The latter imago is, however, so young that its shape was spoilt when caught or during the preservation, and I prefer, therefore, to postpone the description until more material is available. Meanwhile I must consider the 2 mites here mentioned as 2 different new species, and shall now give the most conspicuous characteristics of *A. meridionalis* ♀.

Measurements.—

Length of body 1·95 mm.
Width ,, 1·16 mm.
Height ,, 1·35 mm.
Length of a palp (curved) 0·3 mm.

The *colour* is green.

The *outlines* of the body, as seen from above, is shown in fig. 40. The mite is very broad, in front nearly rounded, but posteriorly with sharp angles, like *A. tricuspidator* (Müller) ♀, except that the angles are more obtuse. The posterior margin reaches further backwards than the angles, and is flattish, rounded, and furnished with the usual marginal hairs.

The *under side* differs from that of the described species, particularly in having smaller *pore-plates* (fig. 41); these latter are short, weakly and regularly tapering and rounded at the ends.

From the side a pair of *dorsal humps* may be seen externally to the anterior curve of the dorsal line, which here bends a little inwards (fig. 40). The humps are not pointed.

The *maxillary lip* is very small.

The *maxillary palps* (fig. 42) are large and well developed. The fourth segment has a little saddle-like emargination on the extensor side and a long cleft *claw* (fifth segment). It differs from that of *A. capensis* n. sp. in having the large prehensile spine thick, short, and weakly *curved* (fig. 42). The spine on the flexor side of the claw is, on the contrary, very long and straight. The hairs on the antagonistic portion of the fourth segment are relatively small.

This mite is one of the largest *Arrenurus* females, like *A. tricuspidator* (Müller) and *A. auritus* Koenike, 1898 (23).

Locality.—Mr. Purcell collected 1 ♀ in a brack-water pond at Zeekoe Vlei, Cape Flats (March, 1900).

16. Arrenurus convexus ♀, n. sp.

Plate XXI., figs. 43–45.

Length of body 1·35 mm.
Width ,, 1·10 mm.
Height ,, 0·90 mm.

The *colour* is brown.

I am not quite certain whether this female belongs to the subgenus *Truncaturus* Sig Thor, 1901 (32), or to the subgenus, *Petiolurus* K. Thon, 1900 (33). I incline to the latter view, but it would be necessary to see the male in order to decide.

The *shape* of *A. convexus* ♀ appears broadly ovoid when seen from above (fig. 43) or from below (fig. 44). The body is thick and highly convex, the back being without dorsal humps. The dorsal line is large and wide, without bends, and is closed posteriorly.

On the *ventral side* (fig. 44) strong transverse wrinkles are observable on the third and fourth pairs of *epimera*.

The most evident characteristic of this species is the shape of the *genital pore-plates*, which distinctly differs from that of all the known African species. The genital opening is large, with large valves, which are surrounded by the inner ends of the pore-plates. These latter taper rapidly, the anterior margin sloping strongly backwards. Both margins are sinuous, converging to an acute angle with obtuse tip (fig. 44).

The "*anus*" is situated near the hind end of the body.

The *maxillary* sinus and lip are small.

The *maxillary palps* (fig. 45) have the ordinary shape without important deviations. The fourth segment is of uniform thickness, with 2 small hairs on the extensor side near the distal end, a moderately long, straight spine near the flexor side, and 2 small hairs on the antagonistic portion. The fifth segment (claw) is thick, bifid, and possesses a long hair on the convex extensor side and a strong spine at the middle of the bent flexor side.

The *legs* show no very remarkable characteristics.

Locality.—Mr. Purcell collected 1 ♀ in a fresh-water pond near Retreat Vlei, Cape Flats (October, 1900) (Reg. No. 4634).

Paris, May 1, 1902.

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EXPLANATION OF THE FIGURES.

Eulaïs purcelli n. sp. Figs. 1–4. Pl. XVI., XVII.

FIG.

1. Eye-plates with the long eye-bridge; *h*, hair-pore.
2. Maxillary organ (left side); *k*, oral fringe round the large mouth-opening; *pf*, anterior maxillary process; *pp*, posterior maxillary process; *ls*, air-sack; *ph*, pharynx.
3. Mandible; *s*, mandibular sheath; *h*, mandibular claw; *st*, pointed stigmatic process.
4. Left maxillary palp (outer side).

Eulaïs lightfooti n. sp. Figs. 5–8. Pl. XVI., XVII.

5. Eye-plates with the short eye-bridge; *h*, hair-pore; *p*, muscle-peg.
6. Maxillary plate, &c. (from the under side, flattened); *pp*, posterior maxillary process; *ph*, pharynx.
7. Mandible; *st*, stigmatic process.
8. Right maxillary palp (outer side).

Eulaïs variabilis n. sp. Figs. 9–15. Pl. XVI., XVII.

9. Eye-plates; *h*, hair-pore.
10. Eye-plates of var. *magna* n. var.; *h*, hair-pore.
11. Eye-plates of var. *intermedia* n. var.; *h*, hair-pore.
12. Maxillary organ (right side); *k*, oral fringe; *pf*, anterior maxillary process; *pp*, posterior maxillary process; *ls*, air-sack; *ph*, pharynx.
13. Right maxillary palp (outer side).
14. Right maxillary palp, showing 4 last segments from inner side.
15. Epimeral and genital area, with pores, hairs, "anus," &c.

Capeulaïs crassipalpis n. sp. Figs. 16–22. Pl. XVIII.

16. Epimeral area and maxillary organ from the ventral side.
17. Eye-plates (upper side).
18. Eye-plates from the inferior (inner) side; *m*, muscles.
19. Mandible.
20. Left maxillary palp (inner side).
21. The same from the outer side.
22. Thick fourth leg (inner side).

Limnesia africana n. sp. Figs. 23–26. Pl. XIX.

23. Left maxillary palp of ♀.
24. Right maxillary palp of ♀.

FIG.

25. Genital area and the third and fourth epimera of ♂.
26. Genital area and the inner angles of the third and fourth epimera of ♀.

Curvipes tridens n. sp. ♀ Figs. 27–30. Pl. XIX.

27. Right maxillary palp.
28. Mandible.
29. Epimeral and genital area, "anus," &c.
30. Genital area, &c., highly magnified.

Arrenurus purcelli n. sp. ♂. Figs. 31–34. Pl. XX.

31. Dorsal surface of body.
32. Ventral surface of body.
33. Hinder end of the dorsal surface, highly magnified.
34. Left maxillary palp (inner side), highly magnified.

Arrenurus capensis n. sp. ♂. Figs. 35–39. Pl. XX.

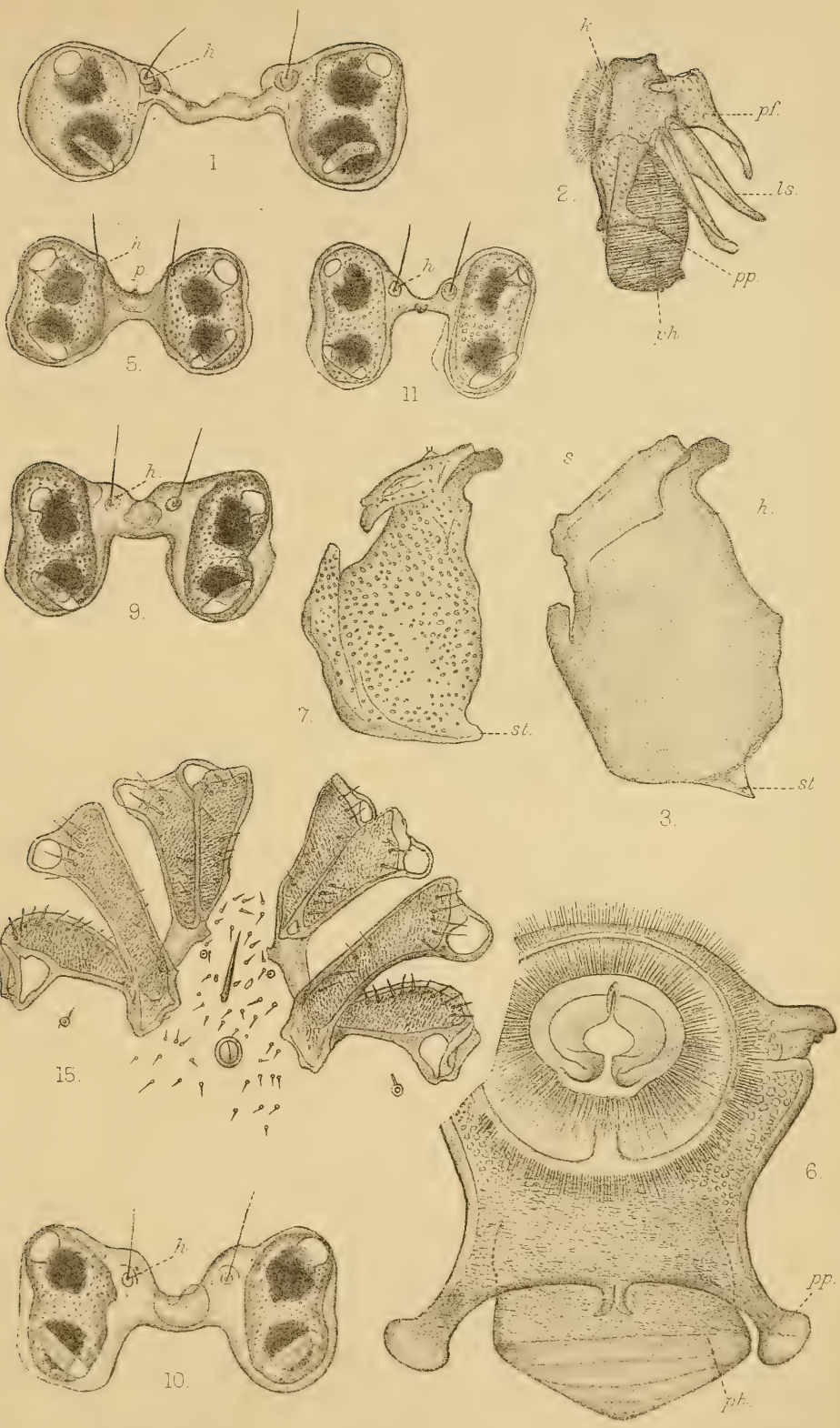
35. Body (seen from the left side and obliquely from above). One notices the 4 dorsal humps, the hind angles, the petiolus and the hyaline membrane and, on the fourth leg, the large process or spur. The dorsal line is not drawn in.
36. Dorsal surface of body.
37. Hind end of petiolus, highly magnified, with the apparent perpendicular but not chitinised process.
38. Left maxillary palp, highly magnified and seen from the outer side, but with the prehensile spine, *sp*, visible; *cl*, fifth segment (claw).
39. Contours of the right maxillary palp (inner side); *sp*, prehensile spine; *cl*, fifth segment (claw).

Arrenurus meridionalis n. sp. ♀. Figs. 40–42. Pl. XXI.

40. Dorsal surface of body.
41. Hind margin and genital area with the pore-plates (ventral surface).
42. Maxillary palp, highly magnified.

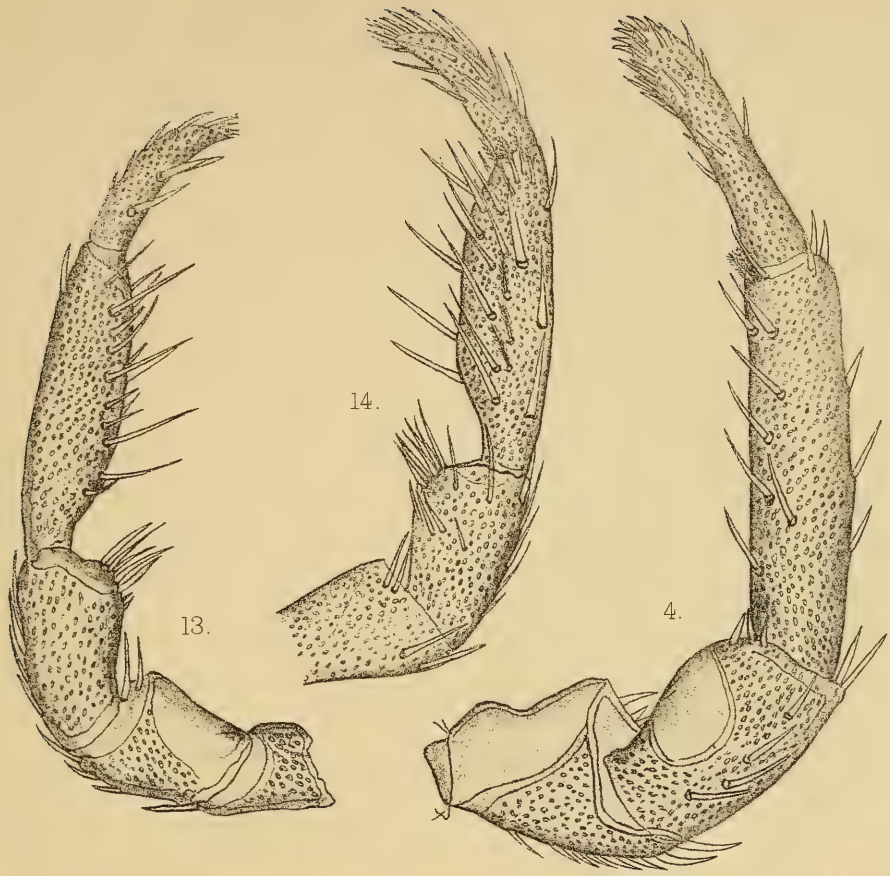
Arrenurus convexus n. sp. ♀. Figs. 43–45. Pl. XXI.

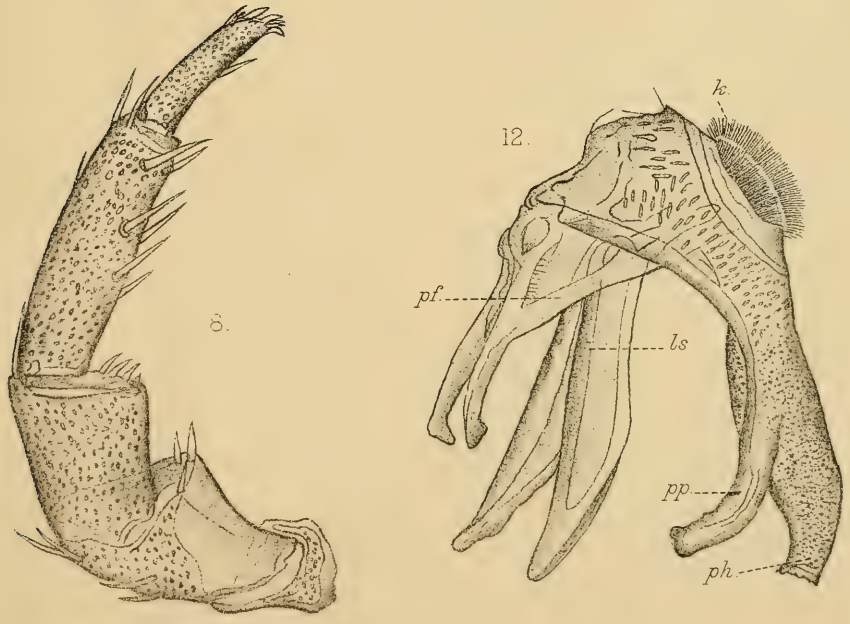
43. Dorsal surface of body.
44. Ventral surface of body.
45. Right maxillary palp (less magnified than in figs. 34, 38, and 42).



West, Newman photo-lith

Sig Thor: South African Hydrachnids. no. 1





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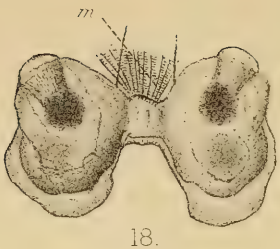

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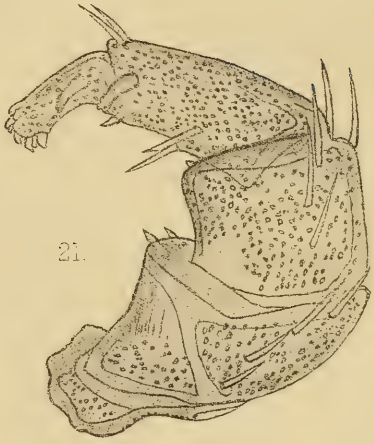

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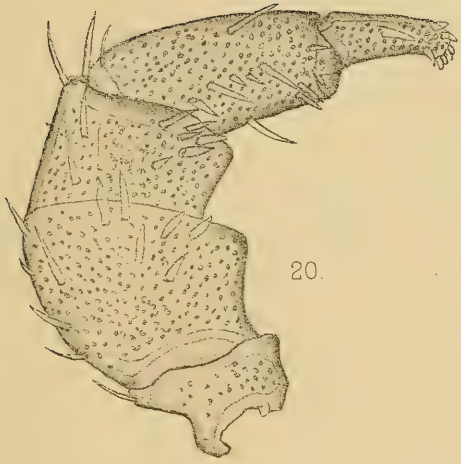

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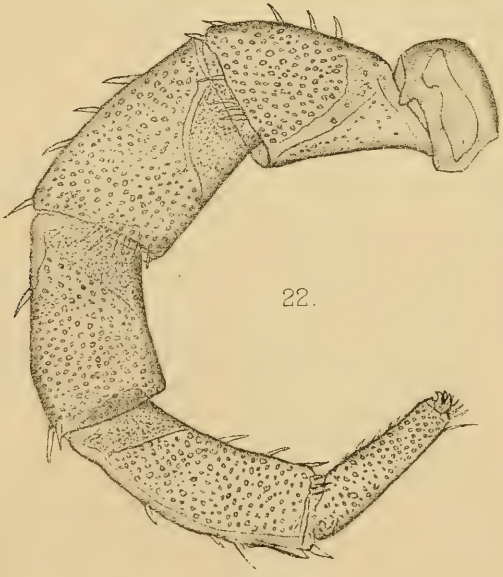

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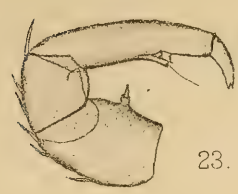

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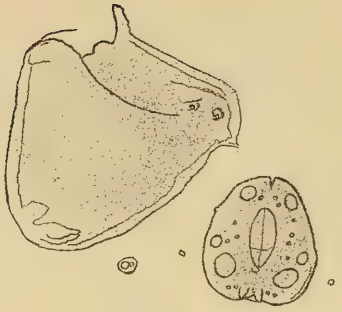

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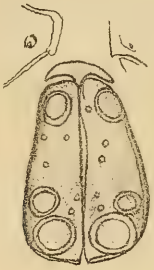

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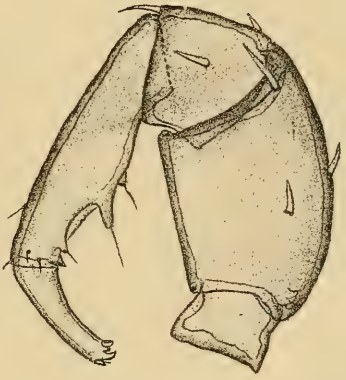

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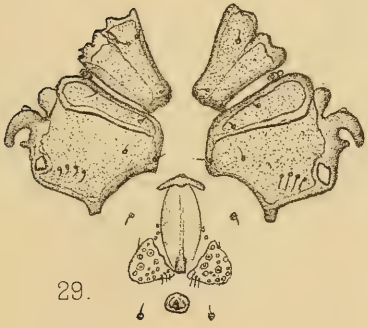

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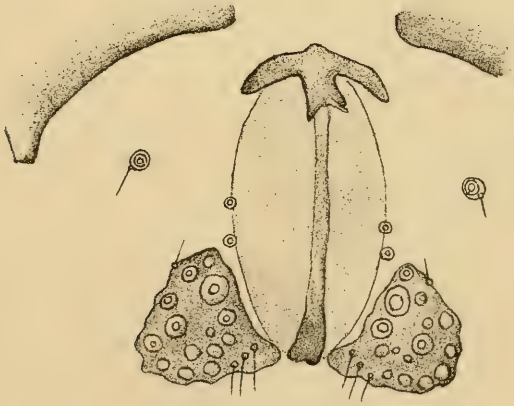

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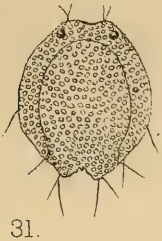

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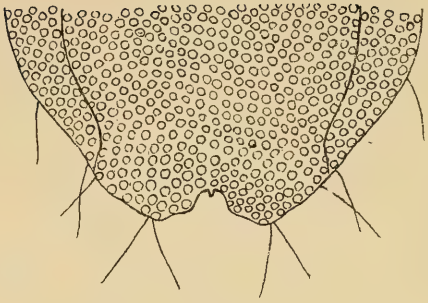

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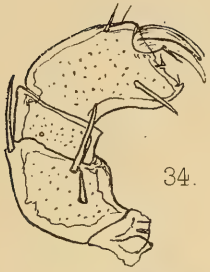

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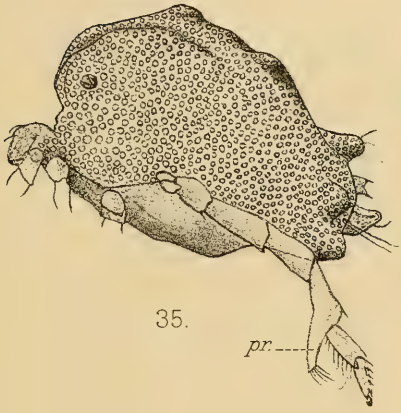

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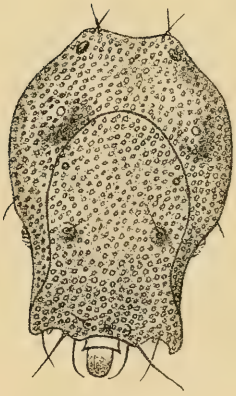

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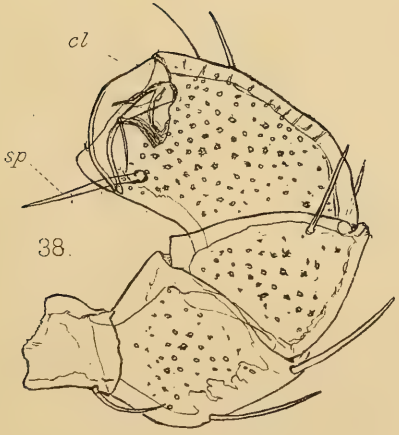

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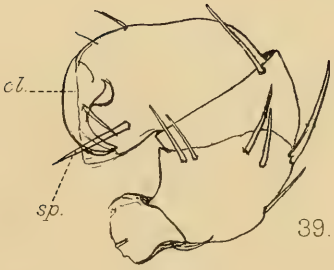

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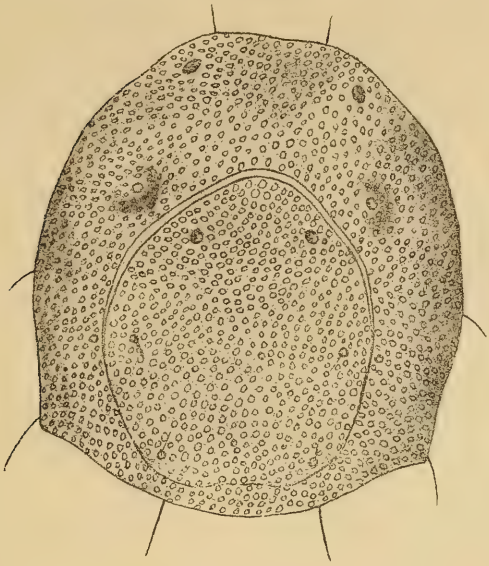

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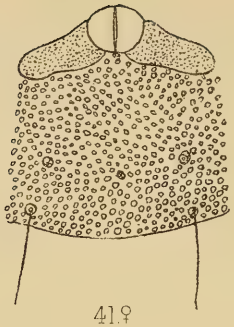

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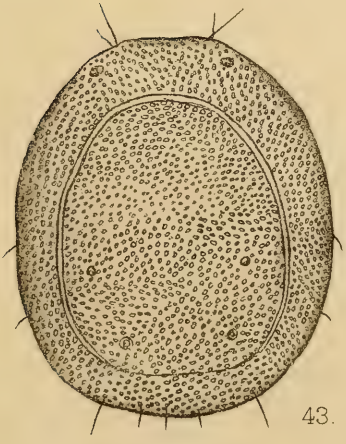

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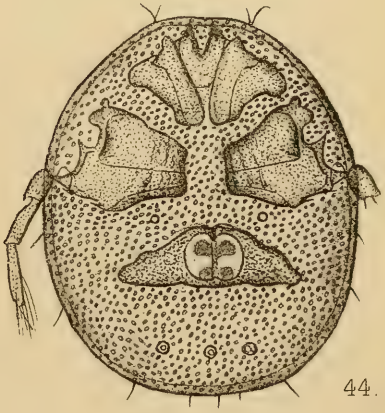

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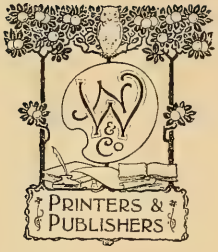
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